DXC-537P
CA-537P
DXF-501CE
VCL-51BBY

COLOR VIDEO CAMERA
CAMERA ADAPTOR
1.5INCH ELECTRONIC VIEWFINDER
ZOOM LENS

VOL.1
GENERAL DESCRIPTION
SERVICE INFORMATION
ALIGNMENT

SONY®
SERVICE MANUAL

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COLOR VIDEO CAMERA

SPECIFICATIONS

Camera Head (DXC-537/537P)

Image device Interline-transfer CCD, 3-chip

Picture elements
768 × 493 (h/v) (NTSC)
786 × 581 (h/v) (PAL)

Sensing area 8.8 mm × 6.6 mm (equivalent to a 2/3-inch pickup tube)

Built-in filters 1: 3200K
2: 5600 K + 1/4 ND
3: 5600 K
4: 5600 K + 1/16 ND

Lens mount Bayonet mount

Signal system EIA standards, NTSC color system (for DXC-537)
CCIR standards, PAL color system (for DXC-537P)

Scanning system
525 lines, 2:1 interlace, 30 frames/sec. (NTSC)
625 lines, 2:1 interlace, 25 frames/sec. (PAL)

Scanning frequency
Horizontal: 15.734 kHz (NTSC)
15.625 kHz (PAL)
Vertical: 59.94 Hz (NTSC)
50.00 Hz (PAL)

Sync system Internal
External with the BS or VBS signal supplied to the GEN LOCK IN connector (when the CA-537/537P, CA-325A/325AP or CA-325B is used) or the reference signal input to the VTR/CCU/CMA connector from the GEN LOCK IN connector of the CCU-M3/M3P/M7/M7P (when the CA-537/537P is used)

Horizontal resolution
700 lines (center)

Minimum illumination
13 lux with F1.8, +18 dB
7.5 lux with F1.4, +18 dB

Sensitivity 2000 lux with F8.0 (Typical) at 3200 K

Gain selection 0 dB, 9 dB or 18 dB, selectable

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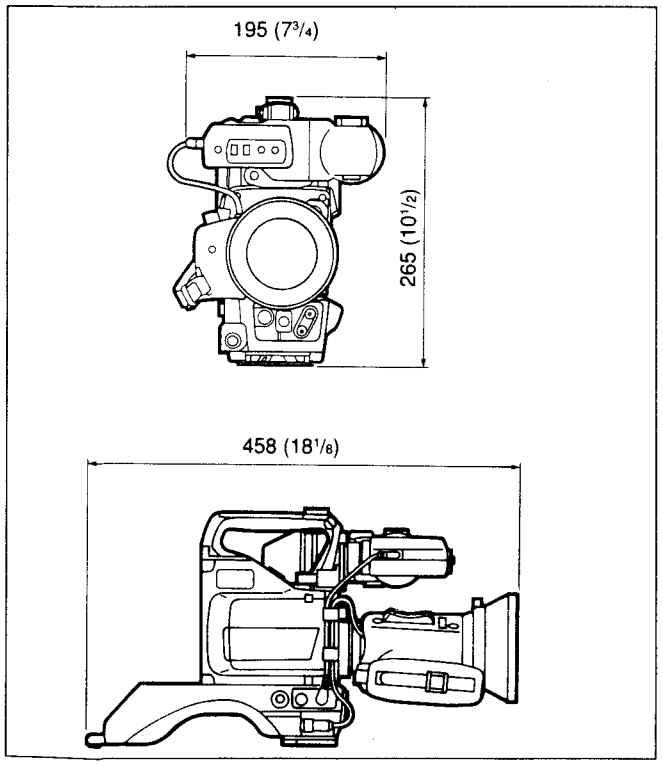
Video output	Composite signal: 1.0 Vp-p, sync negative, 75Ω unbalanced Y/C separate signal: Y: 1.0 Vp-p, sync negative, unbalanced C: burst level 0.286 Vp-p (NTSC) 0.3 Vp-p (PAL) without sync
Signal to noise ratio	62 dB (NTSC, Typical) 60 dB (PAL, Typical)
Registration	0.05% for Zone I 0.05% for Zone II 0.05% for Zone III
Inputs/Outputs	VIDEO OUT: BNC-type LENS: 2/3-inch lens connector (12-pin) VF: 8-pin REMOTE: 10-pin
Power requirements	12 V DC
Power consumption	9.5 W
Operating temperature	–10°C to +45°C (14°F to 113°F)
Storage temperature	–20°C to +60°C (–4°F to 140°F)
Weight	2.2 kg (4 lb 14 oz)
Dimensions	See the illustrations below. Unit: mm (inches)

Dimensions



Carrying Case (LC-421)

Weight	About 7.7 kg (15 lb 7 oz)
Dimensions	About 790 × 440 × 340 mm (w/h/d) (31-1/8 × 17-3/8 × 13-1/2 inches)

Accessories Supplied

CCZQ-A2 camera cable (with Z-type 26-14-pin connectors) (supplied with the DXC-537K/537PK/537L/537PL only) (1)
VCL-916BY zoom lens (supplied with the DXC-537K/537PK only) (1)
DXF-501/501CE electronic viewfinder (supplied with the DXC-537K/537PK/537L/537PL only) (1)
LC-421 carrying case (supplied with the DXC-537K/537PK/537L/537PL only) (1)
VCT-14 tripod attachment (supplied with the DXC-537K/537PK/537L/537PL only) (1)
Lens cap (1)
Chart for flange focal length adjustment (1)

Design and specifications are subject to change without notice.

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SECTION 1
INTRODUCTION

1-1. INTRODUCTION

Choosing from NTSC or PAL Systems

The following explains the differences between the NTSC and PAL systems regarding accessory selection for the DXC-537 series camera.

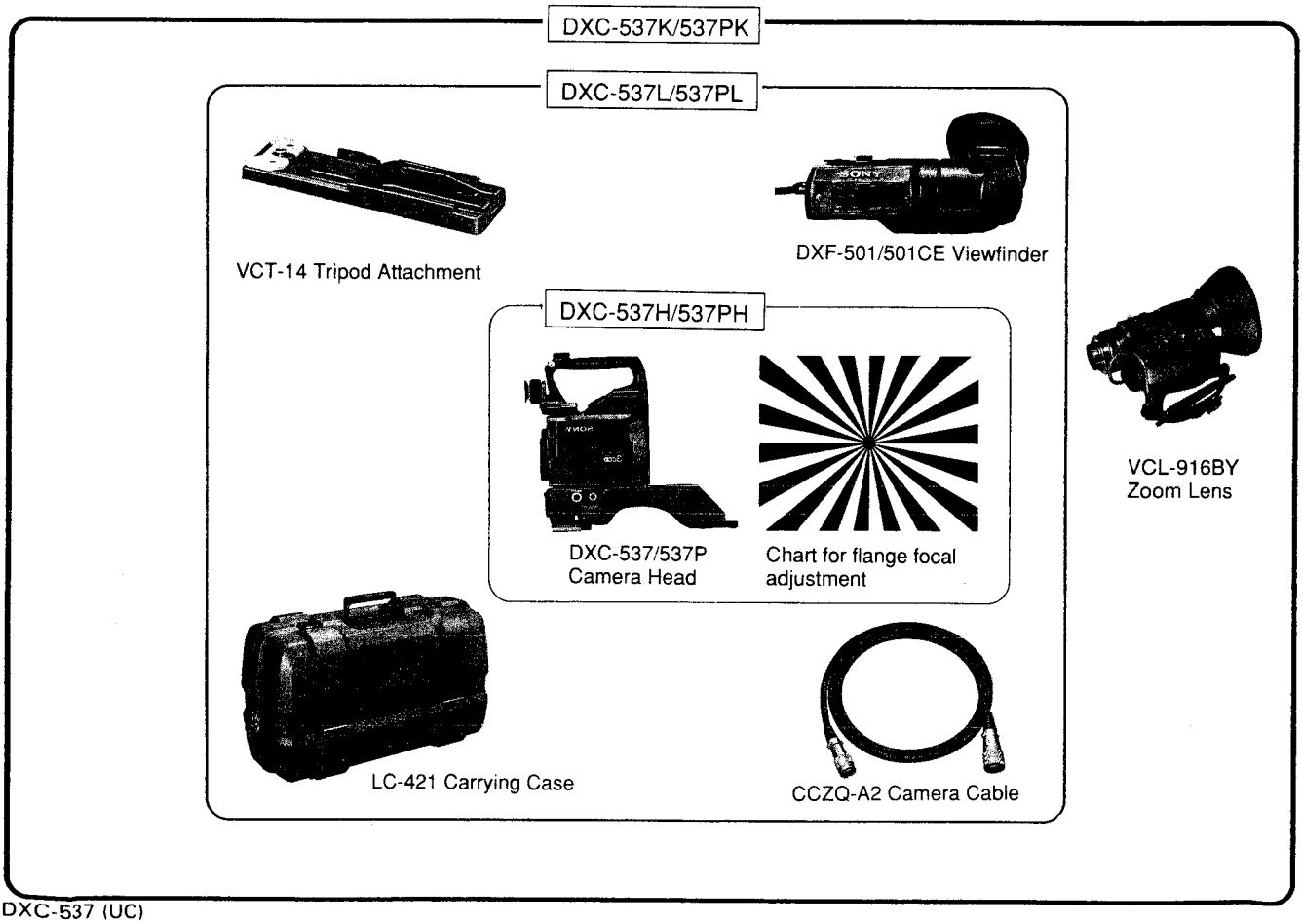
Some PAL components can operate on NTSC equipment and vice-versa. In general, however, this is not the case. You must use the type of equipment and accessories that matches the signal system of your camera. Use the DXC-537 series camera within the NTSC color system, and use the DXC-537P series camera within the PAL system. See the table to the right for other possible component combinations.

The following illustration depicts which components you can use with each piece of equipment. The components in the outermost box can be used with all equipment and those in the innermost box can be used with only a few.

NTSC/PAL Component Combinations

Composition \ Model	DXC-537K/ 537PK	DXC-537L/ 537PL	DXC-537H/ 537PH
DXC-537/537P Camera Head	Yes	Yes	Yes
VCL-916BY Zoom Lens		No	No
DXF-501/501CE Viewfinder		Yes	
LC-421 Carrying Case			
CCZQ-A2 Camera Cable			
VCT-14 Tripod Attachment			
Chart for flange focal length adjustment			Yes

DXC-537 Series Usable Accessories



Notes on Using Accessories with the DXC-537 Series Camera

- If you use the CA-537/537P Camera Adaptor (optional) with this camera, operate the camera according to the instructions in this manual.
- If you use the CA-327/327P Camera Adaptor (optional), operate the camera according to the instructions that come with the adaptor.
- If you use a zoom lens other than the VCL-916BY Zoom Lens, operate the camera according to the instructions that come with the lens. (For further information on accessories, see "Optional Accessories and Recommended Equipment", on page 1-69.)

On Using and Storing the Camera

This section explains how to safely use, store and clean the camera.

When setting up the camera
- Do not attach the zoom lens without reading "Attaching the Zoom Lens and Optional Filter" (page 1-14). Attaching the lens incorrectly may damage the lens.
- Do not directly connect the camera to an AC power line. Use the recommended camera adaptor or use a 12 volt DC power source.
- Do not block air circulation about the camera to prevent internal heat build-up.

When operating the camera
- Avoid rough handling or mechanical shock.
- Avoid strong magnetic fields to prevent signal distortion.
- Avoid operating the camera in environments that exceed the temperature range of –10°C to +45°C (14°F to 113°F).
- Do not point the viewfinder directly at the sun.
- Do not grip the camera by the viewfinder.

When storing and shipping the camera
- Cover the lens with the supplied lens cap when you do not plan to use the video camera for an extended period of time.
- When you transport the camera, repack it as it was originally shipped. Do not discard the packing carton. This affords maximum protection whenever you ship the camera. Do not ship or transport the camera in the carrying case alone.
- Store the camera with the viewfinder moved fully in the direction opposite the viewfinder barrel and the lock ring tightened.

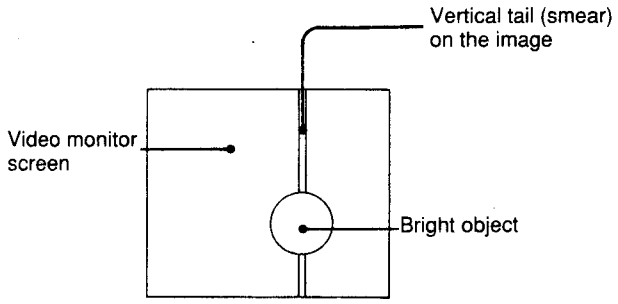
When cleaning the camera
- Clean the cabinet, panel, and controls with a soft, dry cloth or a cloth moistened with a mild detergent solution.
- Do not use any type of solvent, such as alcohol or benzine which might damage the finish.

If you have any questions about this camera, contact your authorized Sony dealer.

Managing Hyper-Sensitivity in the CCD Image Sensor

Because of the high sensitivity of the CCD Image Sensors, the following phenomena may appear on the monitor screen while you are using the DXC-537 series color camera. These phenomena do not mean that there is anything wrong with the camera.

Vertical Smear
Smear tends to happen when an extremely bright object such as an electric light, fluorescent lamp, sunlight, or strong reflection is being shot.



White Dots
White dots may appear in the video output if the camera is used at very high temperatures.

Aliasing
Aliasing may occur when you shoot fine stripes or straight lines. The lines appear jagged.

Poor Pictures
You may not get a clear picture if the GAIN selector is set to 18 dB when you are using the electronic shutter. Use the electronic shutter under lighting conditions where you can obtain a clear picture with the GAIN selector set to the 0 or 9 dB position.

Features of the DXC-537 Series Camera

Hyper HAD™ Sensor CCD Chip Design

The Hyper HAD™ Sensor CCD Chip design employs three 2/3-inch CCD (Charge Coupled Device) images each having a total of about 380,000 (NTSC) or 460,000 (PAL) effective picture elements. The CCD offers better picture quality over tube type pick-up devices by providing:

- higher resolution and sensitivity
- lower lag, higher image burning resistance, and no deflection distortion
- less vibration and magnetic field distortion
- higher S/N ratio that allows you to raise the video output level by 9 dB or 18 dB to get a clear picture under low light conditions

Maximum System Versatility

By attaching optional equipment you can expand the usability of the camera:

- the CA-537/537P Camera Adaptor enables you to control the camera via a camera control unit or VTR
- the CA-325A/325AP or 325B enables multiple outputs of RGB format signal
- a Hi8 format videocassette recorder turns your unit into a camcorder
- the CCU-M7/M7P Camera Control Unit allows you to use the camera as a studio camera
- the various kinds of power sources (battery, AC, and DC) allow you to use the camera under many power situations

Electronic Shutter

The Clear Scan™ Function and the built-in electronic shutter ensure better pictures:

- the Clear Scan™ Function reduces the stripe noise which appears when a CRT screen (such as the screen of a personal computer) is shot by the camera
- the electronic shutter lets you shoot fast moving objects with little blurring

Automatic Adjustment and Memory Functions

The camera automatically adjusts white/black balance as well as camera settings, and stores the adjustments for later use.

Viewfinder Displays

So you don't have to take your eye off what you are shooting, the viewfinder displays adjustment indications and warnings. The viewfinder shows the following four displays:

- Characters:
  show switch settings, warning indications, and the title characters to be superimposed
- Zebra Pattern:
  appears on the portion of the screen where the video output is about 70 to 80 IRE (for NTSC) or 490 to 560 mV (for PAL). This pattern acts as a reference when you manually adjust the iris
- Safety Zone Marker and Center Marker:
  indicate the safety zone for shooting and the center of the picture
- REC Indicator:
  flashes if the connected VTR malfunctions

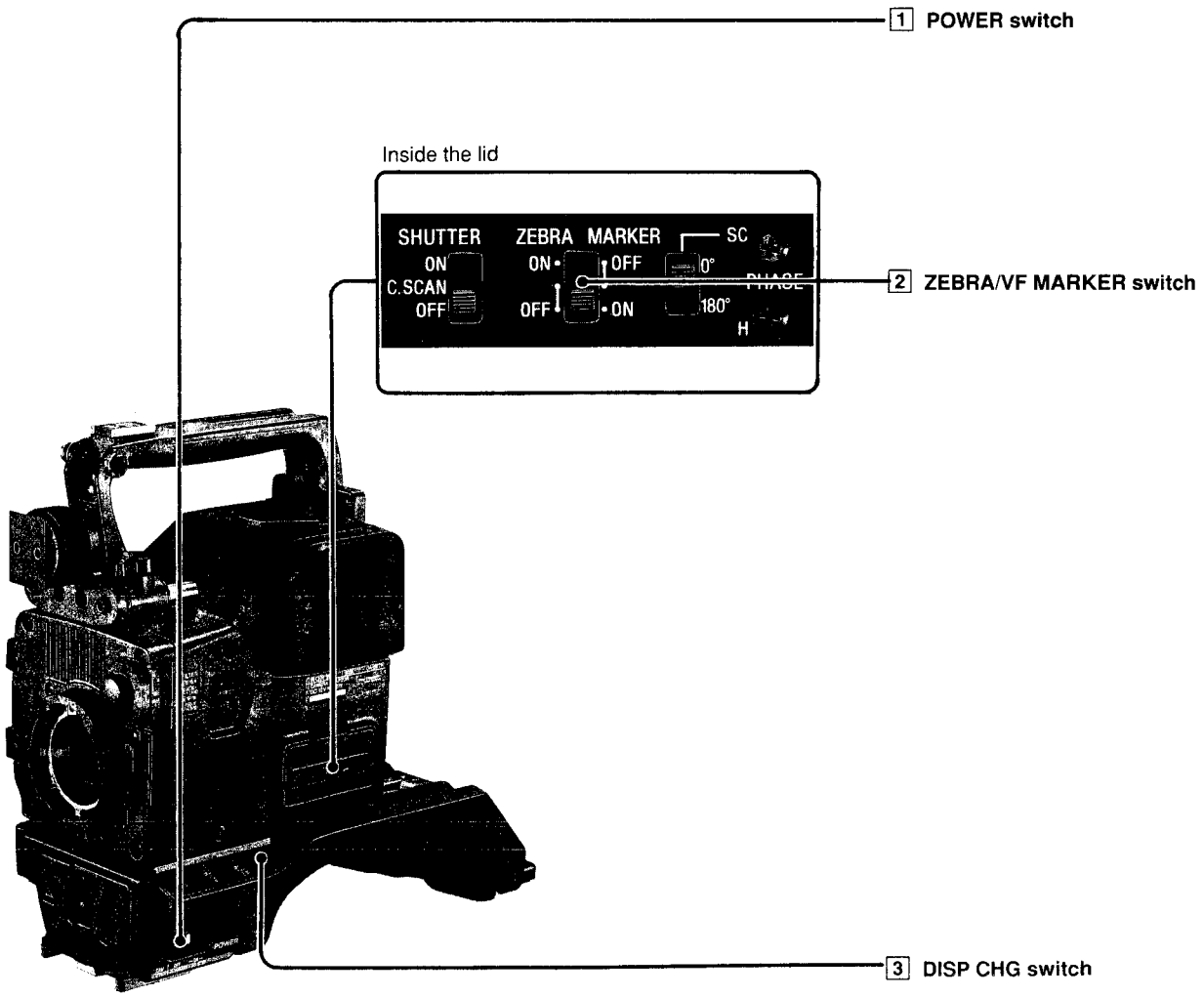
1-2. SET-UP

Location and Function of Parts

DXC-537/537P Camera Head

The DXC-537/537P Camera Head is the modular core of this multipurpose camera system. Depending on your purpose, connect VTRs and camera control units to it via the CA-537/537P or CA-327/327P camera adaptor.

Camera Head Power Supply and Indications



1 POWER switch

OFF: Turns the camera off.

ON SAVE: Select to save power. When you press the VTR start button, there is a delay before recording starts, but the amount of power consumed in this mode is less than when the camera is in stand-by mode (STBY).

ON STBY: Select for a quick start. When you press the VTR start button, recording starts immediately. In this mode power continues to be consumed while the drum heads rotate.

2 ZEBRA/VF MARKER switch

ZEBRA: Set this switch to ON to display the zebra pattern on the viewfinder screen for manual iris adjustment. The zebra pattern appears in the picture where the video level is about 70 to 80 IRE (for NTSC) or about 490 to 560 mV (for PAL). (See page 1-49.)

VF MARKER:

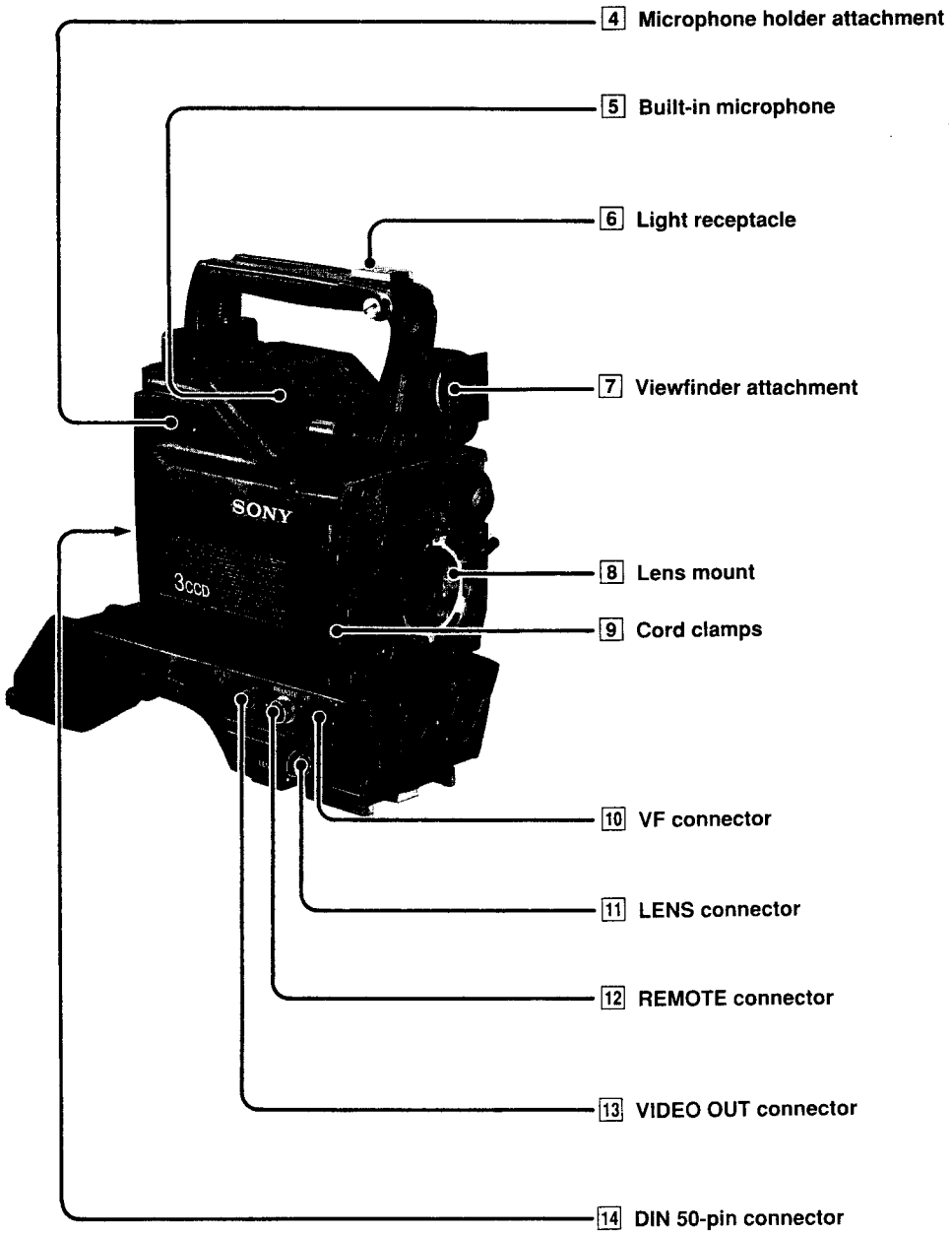
ON: Set this switch to make the center marker and safety zone borders appear in the viewfinder. The safety zone is 90% of the screen area.

OFF: Both the VF marker and zebra pattern disappear from the viewfinder.

3 DISP CHG (display change) switch

Push this switch to change the character display mode of the viewfinder screen (See page 1-33.)

Camera Head Attachments and Input/Output Connectors



4 Microphone holder attachment
Attach an optional CAC-12 microphone holder here (See page 1-24.)

5 Built-in microphone
The built-in microphone functions automatically when a portable VTR is connected to the camera. This allows you to make a sound recording along with the video recording.
When an external microphone is connected to the MIC IN connector on the CA-537/537P camera adaptor, the built-in microphone does not function. We recommend you use a uni–directional external microphone to get a better sound recording.

6 Light receptacle
This allows you to attach a video light or other accessories.

7 Viewfinder attachment
Attach the DXF-501/501CE viewfinder here.

8 Lens mount
Attach the VCL-916BY zoom lens and related equipment here.

9 Cord clamps
Secures the viewfinder and lens cords.

10 VF connector
Connect the viewfinder cord here.

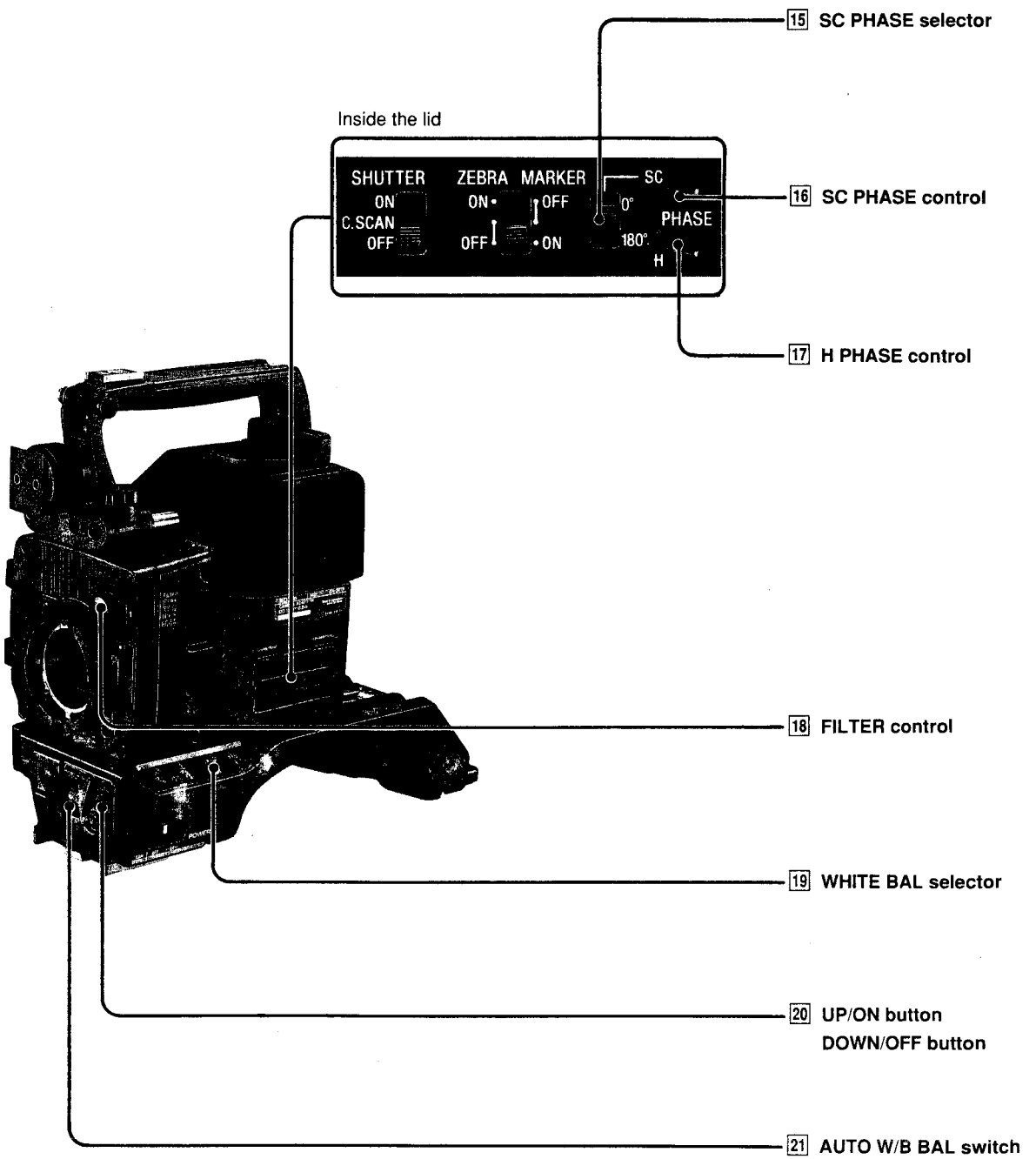
11 LENS connector (12-pin)
Connect the lens cord here.

12 REMOTE connector (10-pin)
To operate this camera from an RM-M7G Camera Remote Control Unit, connect the camera to the remote control unit via this connector. Make sure the CAMERA SELECT switch on the bottom of the RM-M7G is set to "1", the factory preset position.

13 VIDEO OUT (output) connector (BNC connector)
To check the picture of the camera you are shooting, connect to the input connector of a video monitor. Also you can connect to the video input of a VTR. Title characters displayed on the viewfinder screen output from this connector.

14 DIN 50-pin connector
Connect to the 50-pin connector of the camera adaptor or EVV-9000/9000P.

Camera Head Switches and Controls



15 SC (subcarrier) PHASE selector
Switch this selector to 0° or 180° to roughly adjust the SC phase difference between the gen-lock input and the video output signals when using two or more cameras simultaneously. (See page 1-51.)

16 SC (subcarrier*) PHASE control
Use a small screwdriver to fine tune the SC phase. Do this after roughly adjusting the SC phase using the SC PHASE selector (page 1-51). Do this adjustment when you are using two or more cameras simultaneously.

17 H (horizontal) PHASE control
Use a small screwdriver to adjust the H phase difference between the gen-lock input and video output signals. (See page 1-51.)

18 FILTER selector
Selects the appropriate filter according to lighting conditions.

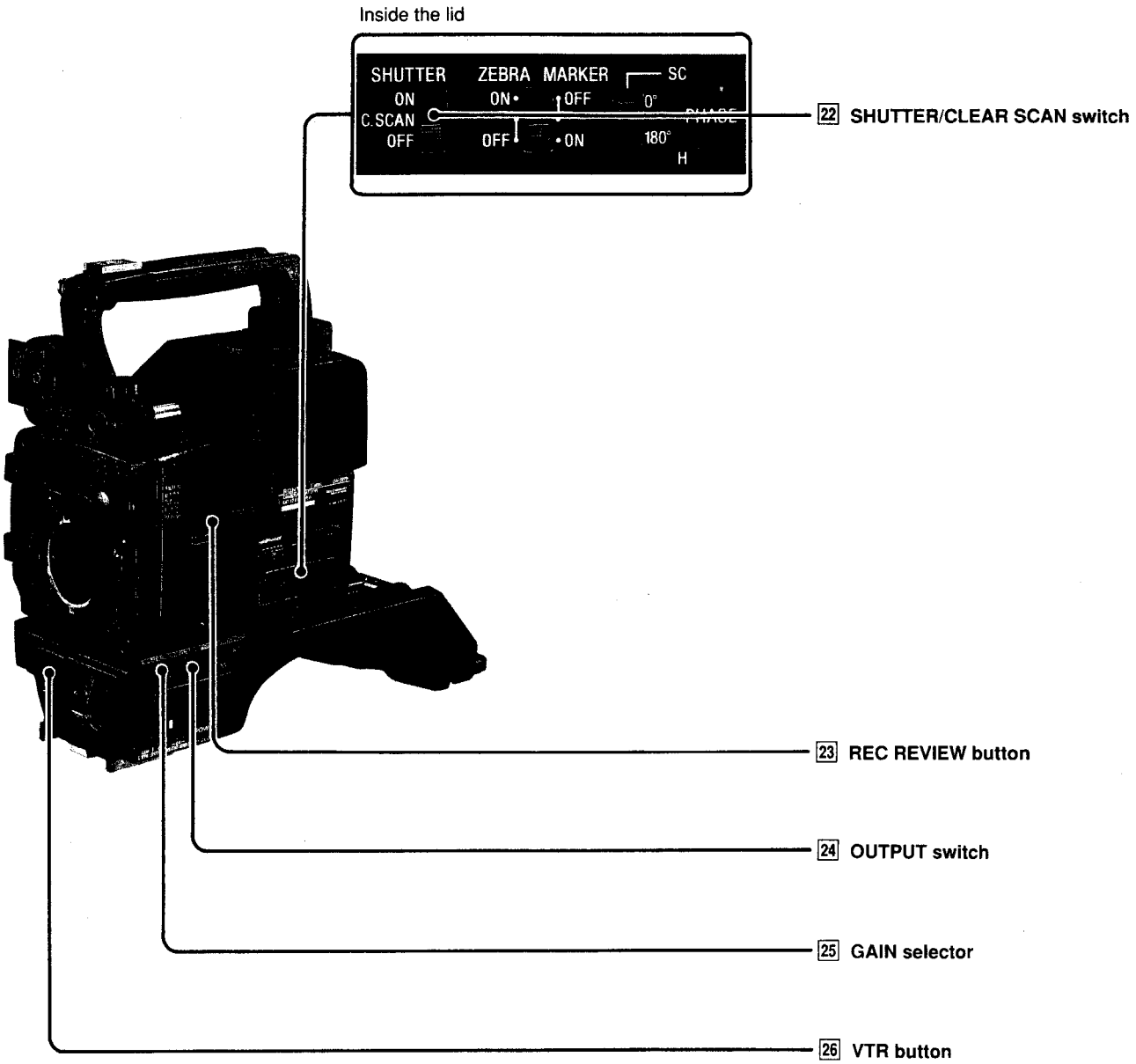
19 WHITE BAL (White balance memory) selector
A or B: Select A or B to make the camera use the white balance setting stored in memory position A or B.
PRE: Set to PRE when there is no time to adjust the white balance. This function provides a factory-preset white balance value for a color temperature of 3200K for the selected FILTER selector position.

20 UP/ON button and DOWN/OFF button
Press either of these buttons with the DISP CHG switch to make one of the following six settings to:
ⓐ Set the title characters (See page 1-52.)
ⓑ Turn on/off the LOW LIGHT indication (See page 1-31.)
ⓒ Adjust the reference level of the automatic iris (See page 1-35.)
ⓓ Adjust the detail level (See page 1-48.)
ⓔ Adjust the master pedestal level (See page 1-41.)
ⓕ Adjust the shutter speed (See page 1-42.)
ⓖ Select CLEAR SCAN (See page 1-43.)

21 AUTO W/B BAL (automatic white/black balance adjustment) switch
Select "A" or "B" with the WHITE BAL selector, and push this switch to WHT to automatically adjust white balance. To automatically adjust black balance, push this switch to BLK. You can do this irrespective of the WHITE BAL selector setting. The setting value is stored in the camera's memory. When you release this switch, the switch returns to the center position automatically. (See pages 1-44 and 1-46.)
WHT: Select for automatic white balance.
BLK: Select for automatic black balance and black set level adjustment.

***Subcarrier**
Color information that is contained within a composite video signal. The signal amplitude is for color saturation (chromaticity) and its phase to color burst is for hue (color).

Camera Head Output Selectors



22 SHUTTER/CLEAR SCAN switch

Flip this switch to control the electronic shutter or operate the Clear Scan function.

ON: In the SHUTTER position, this switch activates the electronic shutter. To select the shutter speed, use the DISP CHG button and the UP/ON or DOWN/OFF button. (See page 1-42.)
In the CLEAR SCAN position, this switch activates the Clear Scan function. To change frequencies, press the UP/DOWN button (displayed in Hz). The frequency you select is stored in the camera's memory. The frequency selection ranges as follows:
NTSC: 60.4 to 101.1 Hz.
PAL: 50.3 to 101.1 Hz.

OFF: Push to this position to deactivate the electronic shutter and Clear Scan function.

23 REC (record) REVIEW button

Press this button when using other format video cassette recorders with this camera to check the recorded picture while recording. (For details, refer to the operations manual for the other video cassette recorder.)

OUTPUT switch

24 Flip this switch to transfer the video signal output to the VTR, viewfinder, and the video monitor, or to transfer the color bar signal to the camera output or vice-versa.

BARS: A SMPTE type (for the DXC-537) or EBU (for the DXC-537P) color bar signal is output.
Note that with the SMPTE type, the I and Q signal in the color bars is replaced by black.
For example, use this setting for the following purposes:
- Adjusting the video monitor.
- Recording the color bar signal.

CAM: The video signal from the camera is output.

25 GAIN selector

Select a higher setting to lighten dark pictures. When the picture is dark though the iris is open, use this selector.
0 dB: Normal setting.
9 dB: Raises the video output level by 9 dB.
18 dB: Raises the video output level by 18 dB.

26 VTR button

- **When connecting the camera to a portable VTR:**
  Press this button to start and stop recording.
- **When connecting the camera to a CCU-M7/M7P or CCU-M3/M3P:**
  Keep this button depressed to monitor the return video pictures on the viewfinder. Release it to monitor the camera pictures.

Accessory Attachment

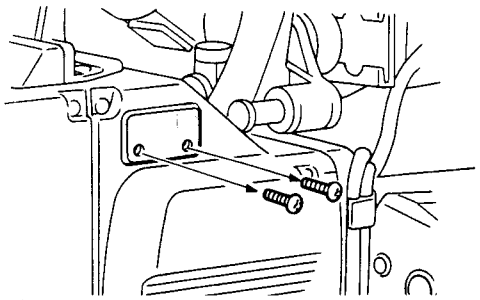
Attaching/Detaching a Hi8 Format Videocassette Recorder

To attach an EVV-9000/9000P Hi8 Format Videocassette Recorder to the camera head follow the above procedures for attaching and detaching the CA-537/537P Camera Adaptor.
Refer to the EVV-9000/9000P operations manual for instructions on how to operate the videocassette recorder with the camera head.

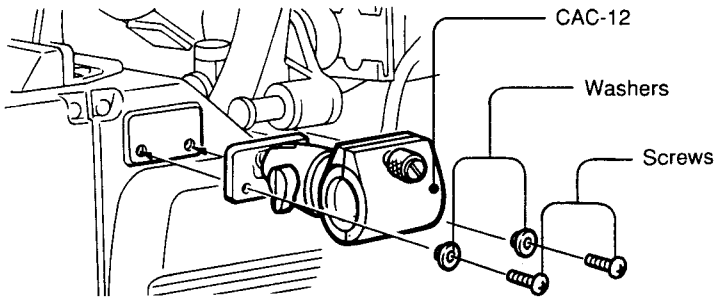
Attaching a Microphone

In order to attach an ECM-672 External Microphone (optional), first fit a CAC-12 Microphone Holder (optional) to the camera head.

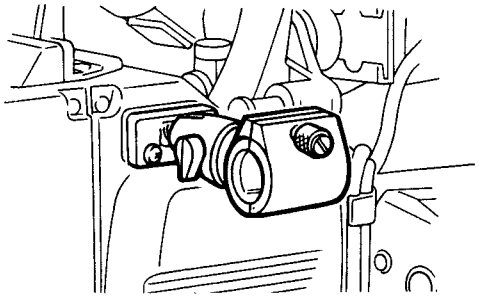
1 Remove the two screw from the side of the camera head above the words "SONY".



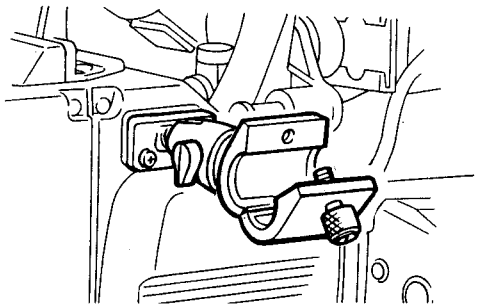
2 Using the screw removed in Step 1, attach the CAC-12 Microphone Holder.



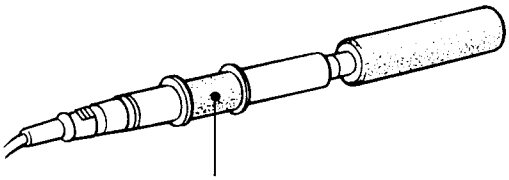
3 Loosen the microphone holder bolt.



4 Open the microphone holder.



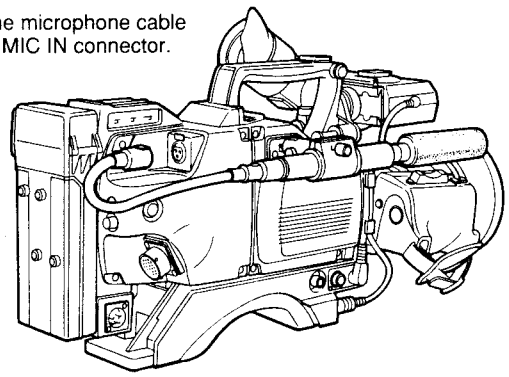
5 When using a bayonet (thin) type microphone, attach a microphone adaptor to the microphone.



Microphone Adaptor
(When you use the ECM-672 Microphone, the microphone adaptor is not necessary.)

6 Insert the microphone into the microphone holder, close the holder and tighten the bolt.

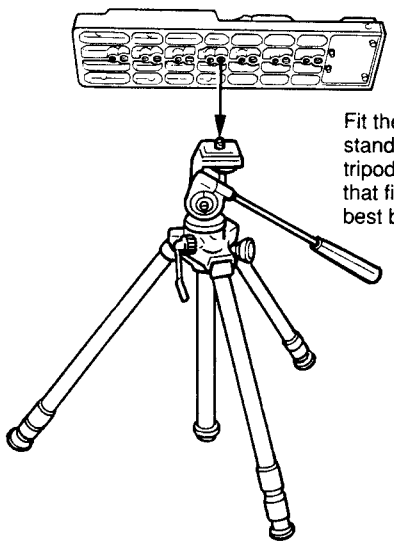
Insert the microphone cable into the MIC IN connector.



Attaching/Detaching a Tripod

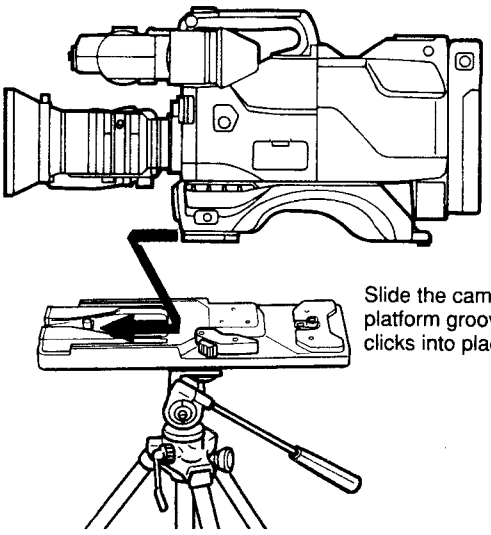
The fully loaded camera may be mounted directly onto a tripod.
However, for a more secure operation, fit the camera to a VCT-14 tripod platform before attaching it to a tripod stand.

1 Attach the tripod adaptor to the tripod.



Fit the screw at the top of the tripod stand into one of the holes in the tripod platform. Choose the hole that fits the screw and gives the best balance to the unit.

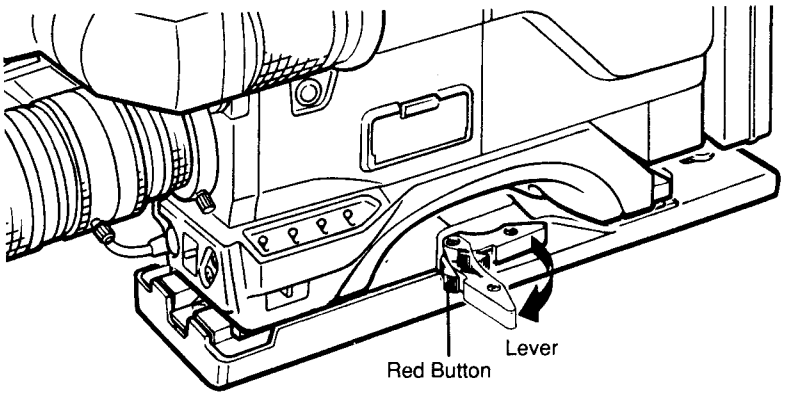
2 Mount the unit on the tripod adaptor.



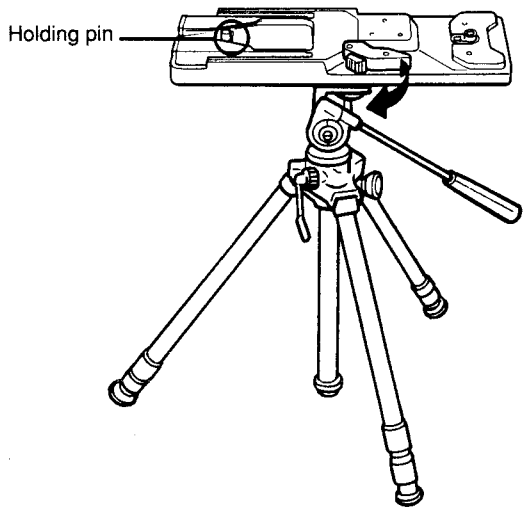
Slide the camera forward along the platform groove until the camera clicks into place.

Detaching the Camera from the Tripod

1 While pressing the red button, push the lever in the direction indicated by the arrow and detach the camera from the platform.



2 Make sure the holding pin has dropped back to its stowed position after removing the camera. Otherwise, you cannot remount the video camera to the tripod platform. To make sure the holding pin goes to its stowed position, press the red button against the lever and the move the lever in the direction of the arrow until the pin drops down.

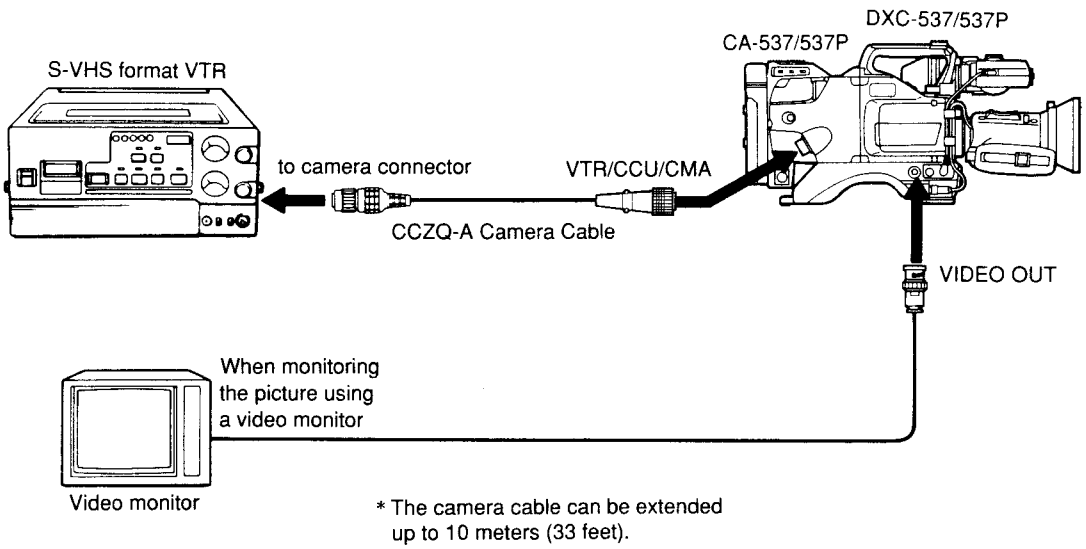


Connections

This section shows you how to connect an S-VHS format portable VTR, regular portable VTR, table-top VTR and camera control unit to the camera head. Depending on the type of VTR connected, the VTR settings, power supply, and camera you choose, functions may vary.
Consult the "VTR-Camera Function Table" on page 1-23 for details on the functions available with different VTRs. For the general use of the camera with a VTR attached, see "Basic Videotaping Operations" on page 1-27.

Before You Begin
Make sure the power switches on the camera, VTR, and other equipment are set to OFF.
Attach the CA-537/537P Camera Adaptor to the camera head before attaching any of the below equipment.

Connecting an S-VHS Format Portable VTR



1 Following the diagram, insert an optional CCZQ-A Camera Cable into the camera connector on the VTR.

2 Insert the other end of the cable into the VTR/CCU/CMA 26-pin connector on the CA-537/537P Camera Adaptor.

3 When monitoring the camera image on a video monitor, insert one end of a coaxial cable into the VIDEO OUT connector on the camera head and the other end into the Video Input connector on the monitor.

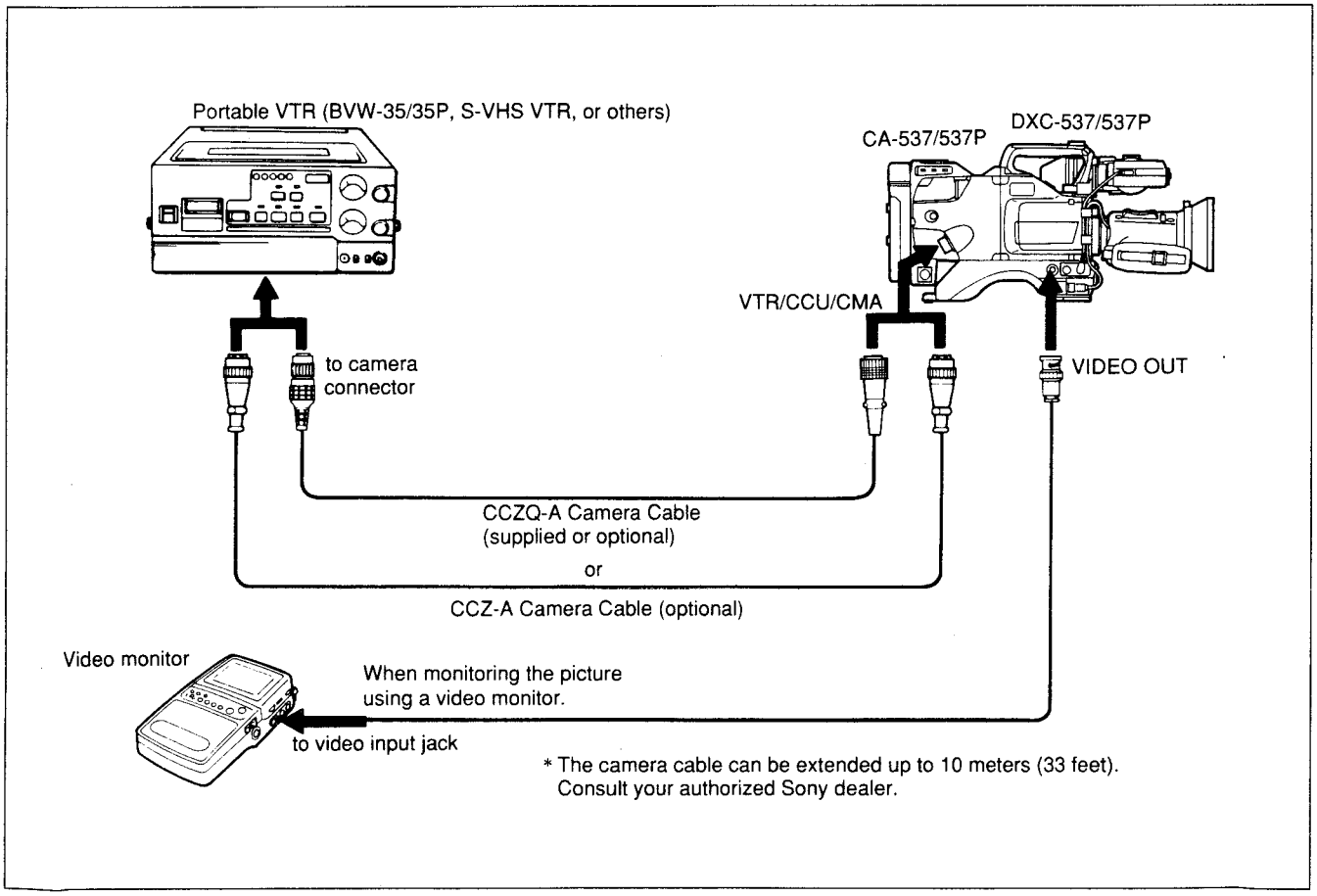
Connecting a Portable VTR with Y/C Separate Input

1 If the monitor and VTR have S-type video connectors, connect a cable between the S-type video output jacks of the VTR and the S-type input jacks of the monitor.
Or, make the connection between the VIDEO OUT connector on the camera and the In connector on the monitor.

2 When connecting the SP-Umatic VTR-8800/8800P or S-VHS format portable VTR to the CA-537/537P Camera Adaptor, set the OUTPUT selector on the camera adaptor to position 3.

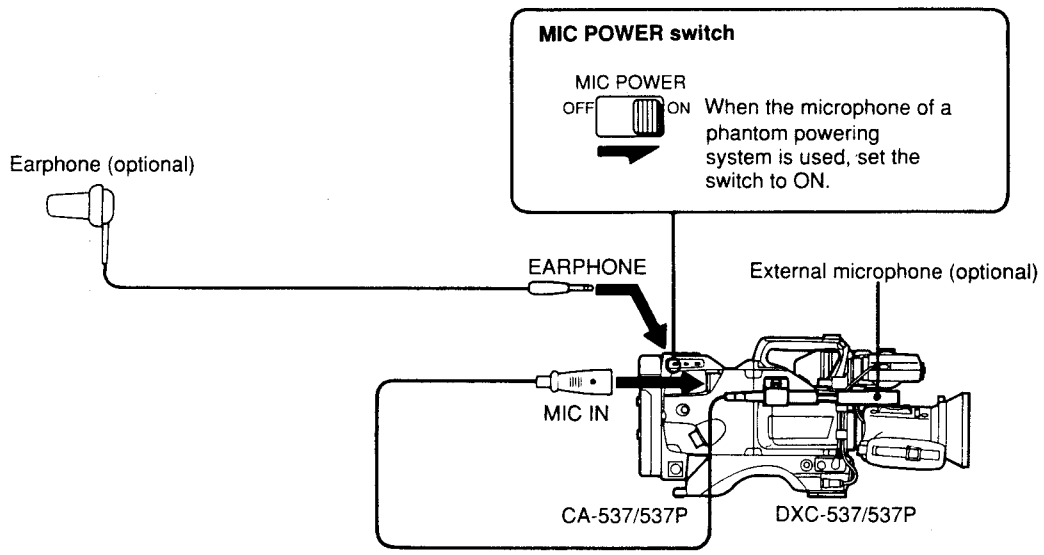
Connecting a Portable VTR

Looking at the diagram below, follow the same procedure as in "Connecting an S-VHS Format Portable VTR" on page 1-16.



Making Connections for Simultaneous Sound Recording

To make a simultaneous sound recording and to avoid recording noise made while handling the camera, connect an external microphone to the MIC IN connector on the camera adaptor (see figure below).
With the below connections, note that the built-in microphone automatically shuts off.

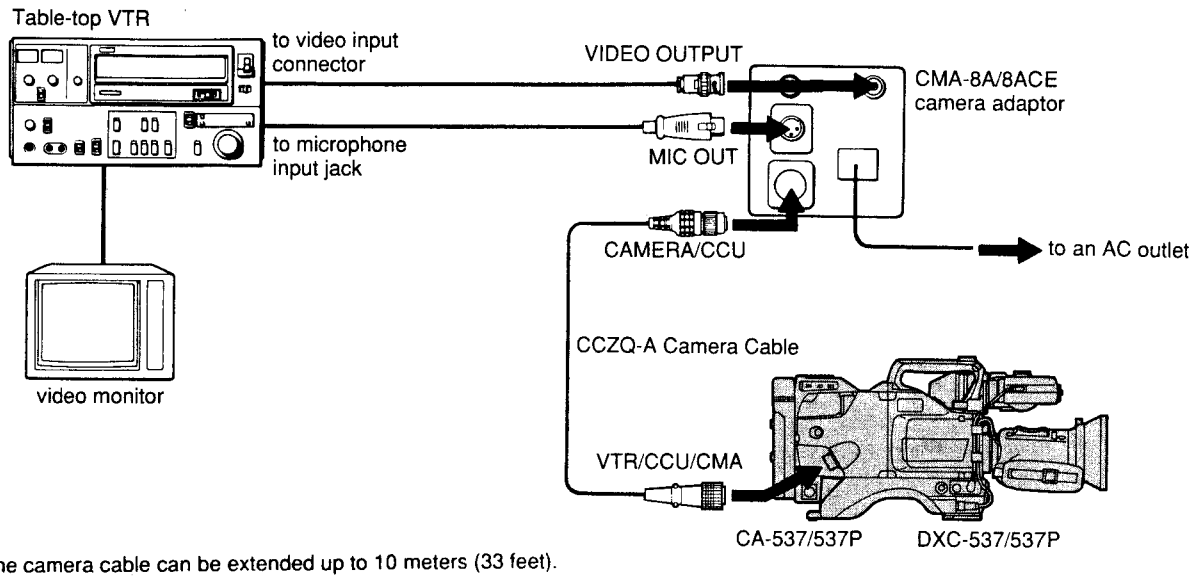


1 Screw the external microphone in place on the camera head via the microphone holder attachment.
If you are using an ECM-672 External Microphone, follow the procedure for attaching this microphone on page 1-12.

2 Insert the microphone cable connector into the MIC IN connector on the camera adaptor.

3 Connect an earphone via the EARPHONE jack on the camera adaptor.

Connecting a Table-Top VTR



* The camera cable can be extended up to 10 meters (33 feet).

1 Following the diagram above, insert an optional coaxial cable into the video input connector on the VTR.

2 Insert the other end of the coaxial cable to the VIDEO OUTPUT connector on the CMA-8A/8ACE Camera Adaptor.

3 Insert a cable into the microphone input jack on the VTR and the other end into the MIC OUT on the CMA-8A/8ACE Camera Adaptor.

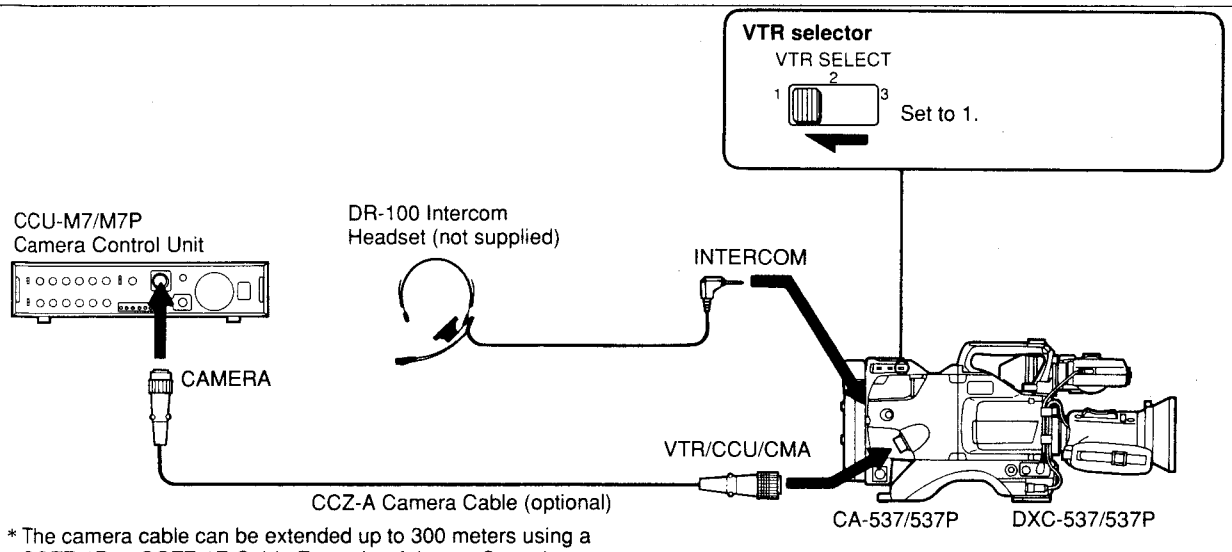
4 Insert a CCZQ camera cable into the CAMERA/CCU connector on the CMA-8A/8ACE Camera Adaptor.

5 Insert the other end of the CCZQ cable into the VTR/CCU/CMA 26-pin connector on the CA-537/537P Camera Adaptor.

6 Connect one end of a power cable to the CMA-8A/8ACE Camera Adaptor and the other end to an AC power outlet.

Connecting a Camera Control Unit

Connecting the CCU-M7/M7P Camera Control Unit



* The camera cable can be extended up to 300 meters using a CCZZ-1B or CCZZ-1E Cable Extension Adaptor. Consult your authorized Sony dealer.

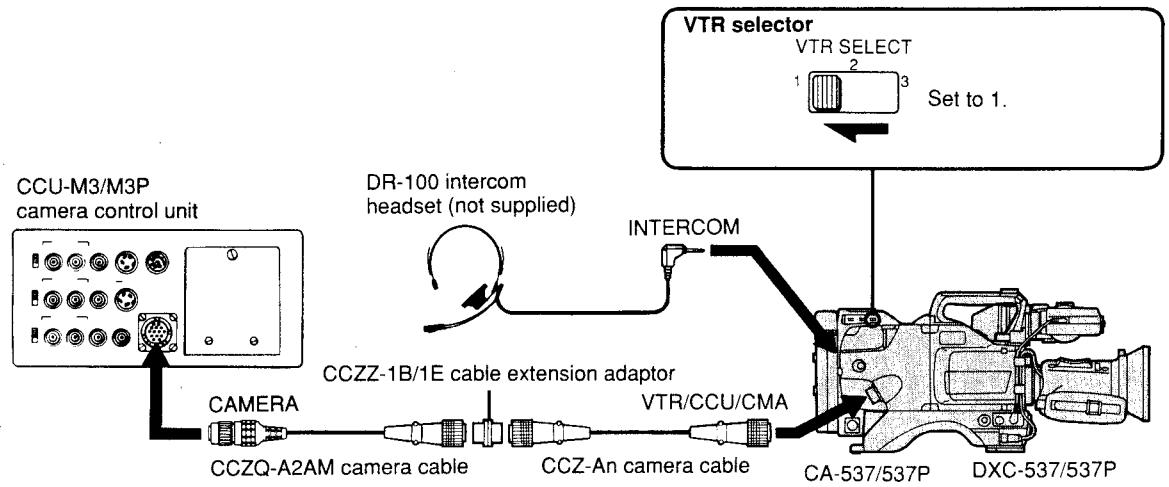
1 Following the diagram above, connect an optional CCZ-A Camera Cable to the VTR/CCU/CMA connector on the camera adaptor.

2 Insert the other end of the cable into the CAMERA connector of the CCU-M7/M7P Camera Control Unit.

3 Connect a DR-100 Intercom Headset to INTERCOM jack on the CA-537/537P Camera Adaptor.

4 Set the camera head VTR selector to "1".

Connecting the CCU-M3/M3P Camera Control Unit



* The camera cable can be extended up to 100 meters (330 feet). Consult your authorized Sony dealer.

1 Following the diagram above, connect an optional CCZ-An Camera Cable to the VTR/CCU/CMA connector on the camera adaptor.

2 Insert the other end of the cable into the CAMERA connector of a CCU-M7/M7P Camera Control Unit.

3 Follow steps 3 and 4 for connecting the CCU-M7/M7P Camera Control Unit (Page 1-20.)

Inoperable Camera Head Functions with the CCU-M7/M7P or CCU-M3/M3P Connected

- When the camera is connected to the CCU, the following switches on the camera head do not operate:
  - GAIN selector
  - WHITE BAL selector
  - H PHASE control
  - SC PHASE control
  - SC phase selector
- The MIC IN connector on the camera adaptor cannot be used as an external microphone input.

White/Black Balance with the CCU-M3/M3P Connected

- When the W/B BALANCE selector on the CCU is set to PRESET or MANUAL, the CCU adjusts the white balance and takes priority over the setting done on the camera.
- If the W/B BALANCE selector is set to AUTO, the white balance can be adjusted using either the camera or CCU controls.
- Do automatic black balance adjustments by setting the W/B BALANCE selector on the CCU to AUTO or PRESET, and the AUTO W/B BAL switch on the camera to BLK.

Gamma and Knee Controls with the CCU-M7/M7P Connected

When the camera is connected to the CCU-M7/M7P, the GAMMA controls and KNEE controls of the CCU-M7/M7P do not affect the video output signal of the camera. However, the setting value of the GAMMA and KNEE level on the monitor screen change.

Shutter and Clear Scan Control with the CCU-M3/M3P Connected

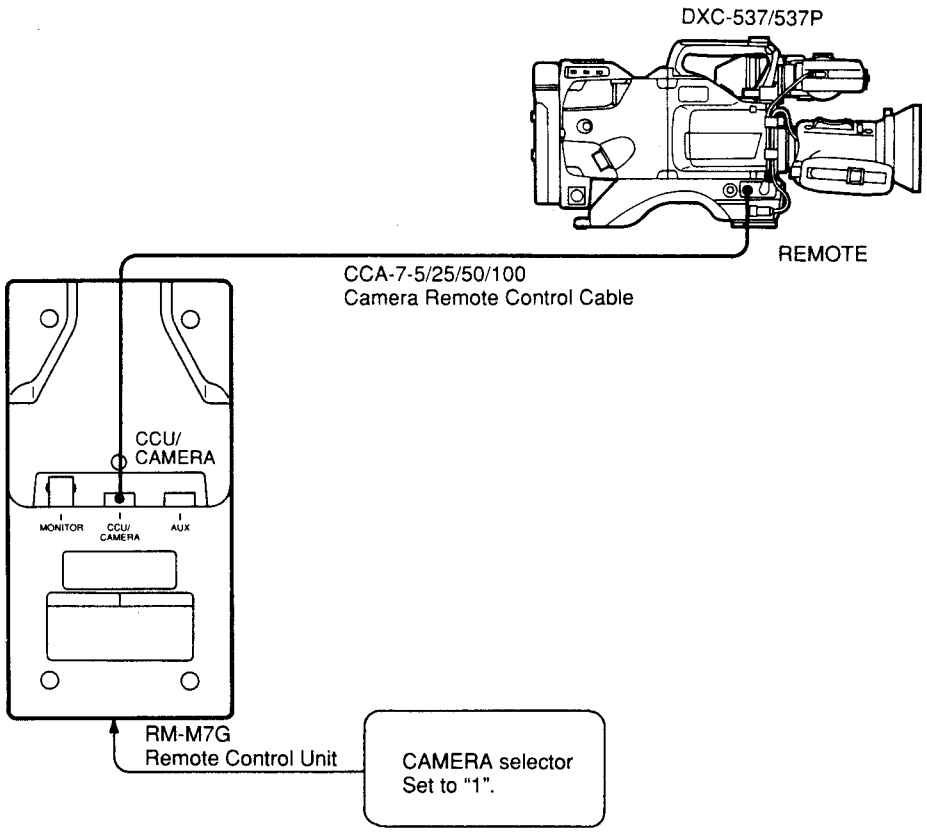
When the camera is connected to the CCU-M3/M3P, control the shutter and Clear Scan functions from the camera head.

Clear Scan Control with the CCU-M7/M7P Connected

When the CCU-M7/M7P is connected to the camera, control the Clear Scan function from the camera head.

Connecting a Remote Control Unit

By connecting an RM-M7G Remote Control Unit (optional), you can control the principal camera functions at a distance. For more details on using the remote control, consult your Sony dealer.



1 Connect the CCA-7-5/25/50/100 Camera Remote Control Cable to the REMOTE connector on the camera head.

2 Connect the other end of the cable to the CCU-CAMERA connector on the remote control unit.

3 Set the CAMERA selector on the RM-M7G Remote Control unit to "1".

Gamma and Knee Controls with the RM-M7G Connected

When the camera is connected to a RM-M7G, the GAMMA and KNEE controls of the RM-M7G do not affect the video output signal of the camera.

Clear Scan Control with the RM-M7G Connected

Control the Clear Scan function from the camera head when the RM-M7G Remote Control Unit is connected.

Using the Camera with a VTR

Set the VTR selector switch on the camera adaptor (at the top of the camera adaptor) to "1", "2" or "3" depending on your VTR (see the VTR-Camera Function Table below).

Depending on the VTR connected to the camera, the functions of the camera and the VTR vary. (Please consult your local authorized Sony dealer if you want to use a VTR other than those shown in the table below.)

VTR-Camera Function Table

VTR selector	Microphone level	Connected VTR	Remote control of VTR start/stop	REC indicator		BATT alarm indication	Audio monitor (on the camera)	Picture shown on the viewfinder		Cable for connection	Power supply from VTR to camera (See note 1.)	AC power adaptor for VTR
				REC indication	VTR alarm			During recording (picture from the camera)	During playback (picture from the VTR)			
1	–60 dB (See note 2.)	BVW-35 BVW-35P	Yes	Yes	Yes	Yes	Yes	Yes	Yes	CCZ-An	Yes	AC-500 AC-500CE
		BVU-150 BVU-150P								CCZQ-nA		CMA-8A CMA-8ACE
		VO-6800 VO-6800PS										
3	–60 dB	VO-8800 VO-8800PS			No	No	No			CCZJ-2	No	
2	–20 dB	AG-6400 (Panasonic)										
3	–20 dB	AG-7400 (See note 4.) (Panasonic)					Yes		Yes (See note 3.)	CCZQ-nA		

Notes on the Camera Function Table

1. For VTRs with a "No" in the "Power Supply from the VTR to Camera" column, the power supply from the VTR is insufficient to operate the camera. Therefore, an independent power source must be provided for the camera.

   Caution

   If the camera is operated without being powered independently, heat will build up in the VTR or AC power adaptor, and the safety circuit will activate. This will prevent the VTR or AC power adaptor from operating properly.

2. When the VO-6800/6800PS Portable VTR is connected to the camera, set the –20 dB/–60 dB camera microphone input selector on the VTR to –60 dB.

3. A picture from a VTR can be seen only when you press the RET button on the zoom lens.

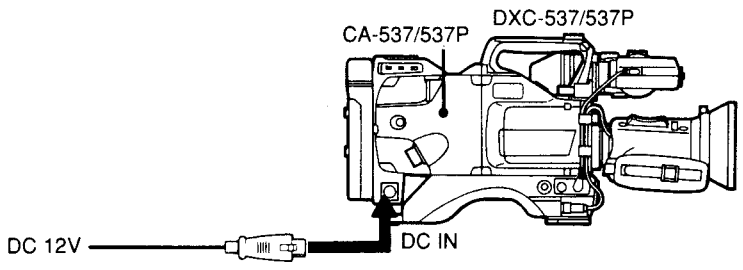
4. To use the AG-7400 VTR, the VTR selector switch must be set to "3" on the camera adaptor for normal (color) recording.

Power Sources

When the CA-537/537P Camera Adaptor is attached, the DXC-537/537P camera is powered by one of three types of power supply: external DC, battery DC, or AC power.

Using a DC Power Supply

Connecting to a DC power outlet



1 To use an external DC (12V DC) power supply, attach a CA-537/537P Camera Adaptor to the camera head.

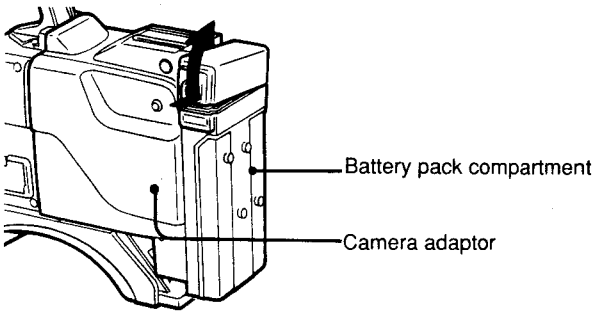
2 Connect a connecting cable from the DC IN connector on the camera adaptor to the external DC power source.

Using a Battery Pack

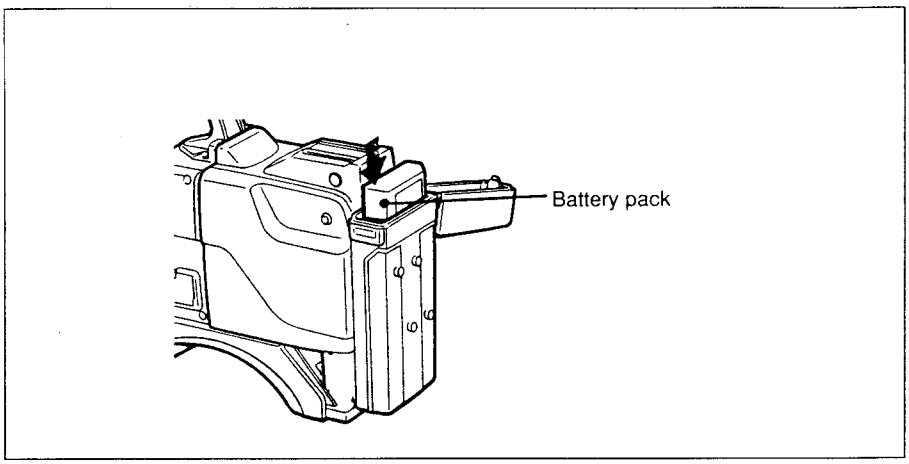
Before using the battery pack, recharge the battery (see "Charging the Battery" below).

Installing the Battery Pack

1 Press the button at the side of the battery case lid and pull open the lid.



2 Slide the battery into the battery case with the arrow on the battery pack pointing downward.



Continuous Battery Operation Time

When a camera adaptor is attached, the fully charged battery pack can continuously power the camera and viewfinder for a certain amount of time (see the table below). However, with the EVV-9000/9000P Videocassette Recorder attached, battery life is shortened.

Battery Life

Battery Type	Battery Life with CA-537 installed	Battery Life with EVV-9000 installed
NP-1B	About 110 minutes	About 75 minutes
NP-1A	About 85 minutes	About 55 minutes

Battery Life Warning

When the battery is nearly exhausted, the warning "BATT.XX.X V" appears on the viewfinder screen showing the voltage level in the "XX.X". If you continue to operate the equipment without changing the battery, the BATT indicator of the viewfinder also lights up to indicate that the battery must be replaced immediately.

Charging the Battery

Recharge the battery pack before each use using the battery charger shown in the table below.

Battery Chargers

Battery pack	Battery charger	Charging time
NP-1B	BC-1WB	About 95 minutes
NP-1A	BC-1WB	About 70 minutes
	BC-1WA	About 70 minutes

Using Power Supplied Through the Camera Adaptor

To use the following equipment, make sure you have attached a CA-537/537P Camera Adaptor.

Using a Portable VTR

1 Align and insert one end of the optional CCZQ Camera Cable into the VTR/CCU/CMA connector on the camera adaptor, and the other end into the VTR 14-pin Q-type camera connector on the VTR.

2 If the camera system is to be powered by a battery pack, check the battery level by turning on the VTR and camera and looking at the BATT indicator in the camera viewfinder.

See the connecting diagram for "Connecting a Portable VTR" (page 1-17.)

Using a Camera Control Unit

1 Align and insert one end of the optional camera cable into the VTR/CCU/CMA connector on the camera adaptor and the other end into the CAMERA connector on the camera adaptor.

2 If the camera system is to be powered by a battery pack, check the battery level by looking at the BATT indicator in the viewfinder.

See the connecting diagram for "Connecting a Camera Control Unit" (pages 1-20 and 1-21.)
For details on power sources for the CCU, refer to the CCU operations manual.

Using a CMA-8A/8ACE Camera Adaptor

Align and insert one end of the optional CCZQ-A camera cable into the VTR/CCU/CMA connector on the camera adaptor, and the other end into the CAMERA/CCU connector on the CMA-8A/8ACE.

For details, refer to the connecting diagram for "Connecting a Table-Top VTR" (page 1-19).

Priority of Power Sources

When two or three power sources (1 to 3 below) are simultaneously connected to the camera, the camera operation only uses one of the power supplies according to the numerical priority listed below (starting with DC power first). The other power sources are automatically cut off.

Type of Power (Priority)	supplied (on the camera adaptor) via the
1. DC power	DC IN connector
2. NP-1B or NP-1A battery	Battery Pack compartment
3. AC power	VTR/CCU/CMA connector

When the EVV-9000/9000P Hi8 is attached, the camera operates on one of the two types of power sources according to the numerical priority listed below.

Type of Power (Priority)	supplied (on the VTR) via the
1. DC power	DC IN connector
2. NP-1B or NP-1A battery	Battery Pack compartment

1-3. OPERATIONS

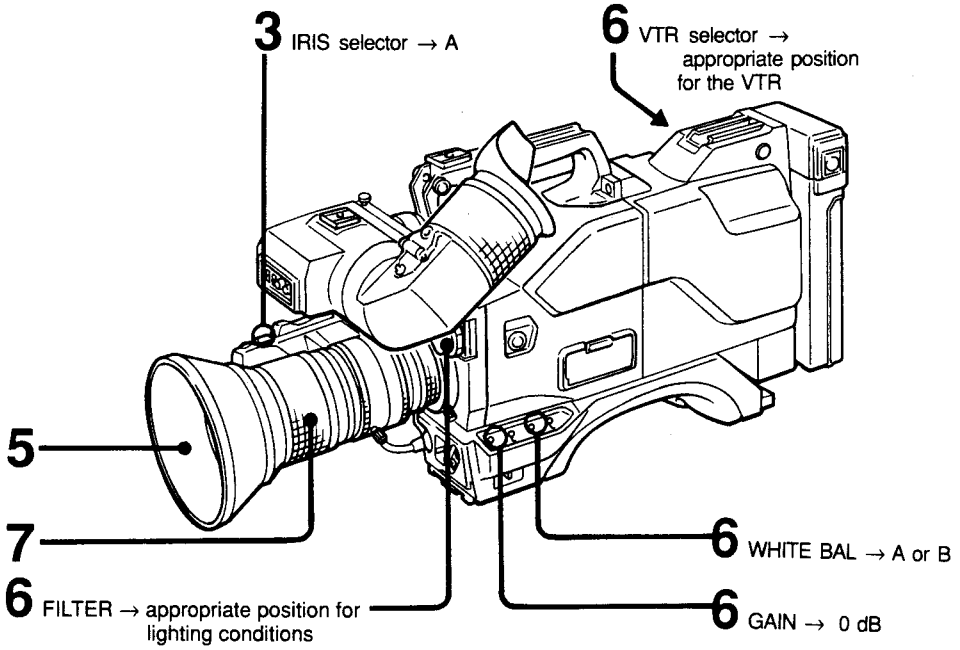
Basic Videotaping Operations

The following is the basic procedure for operating the camera. To get the most out of the videotaping operation, we recommend you do the adjustments and settings on the following pages.

Before You Begin

Make sure that the power supplied from the VTR to the camera is sufficient. If the power supply capacity of the VTR is not sufficient, the camera must be powered independently.

Operating the Camera


3 IRIS selector → A
6 VTR selector → appropriate position for the VTR
5
7
6 FILTER → appropriate position for lighting conditions
6 WHITE BAL → A or B
6 GAIN → 0 dB

1 Check that equipment connections, such as to the VTR, are correct (see pages 1-16 to 1-22).

2 Turn the power switches to the camera and the all the connected equipment to the ON position.

3 Set the IRIS selector on the zoom lens to "A" (see page 1-35).

4 Select the appropriate position for the FILTER selector for the ambient lighting (see page 1-37).

5 Remove the lens cap.

6 Set the following switches:
GAIN switch → 0 dB
WHITE BAL selector → A or B (see page 1-39)
VTR selector (on the camera adaptor) → corresponding to the VTR used

7 Point the camera at an object that is at least one meter (3-1/2 feet) from the lens.

8 Adjust the focus by turning the focus ring while looking at the image on the monitor or viewfinder screen.

Recording with a Portable VTR

1 Turn the power switches on the camera and connected equipment to the ON position.

2 Set the VTR to Record Standby mode.

3 Adjust the black balance and white balance. (For details on how to do this, see "Adjusting the Black Balance," page 1-37 and "Adjusting the White Balance," page 1-39.)

4 Point the camera at a reference object and adjust the lens.
Adjust the
Iris (see page 1-35)
Zoom (see page 1-45)
Close-Up Function (see page 1-47)
Focus (see page 1-46)

5 To start recording, press the VTR button on the camera, the VTR START/RETURN VIDEO button on the camera adaptor, or the VTR button on the lens.
- The REC/TALLY indicator in the viewfinder lights up during recording.
- The return video and playback picture appear on the viewfinder screen display.

6 To stop recording, press the VTR START/RETURN VIDEO button or the VTR button used in Step 5 above.

The BATT Indicator May Light Up When the Camera Goes On

For a brief period after the camera has been turned on, the BATT indicator of the viewfinder may light up and random characters may be displayed on the viewfinder screen. This is not a malfunction.

Recording with a Table-Top VTR

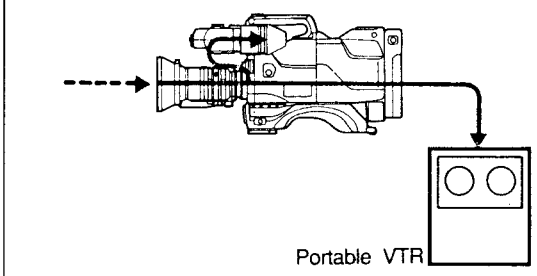
To record using a Table-Top VTR, follow the procedure explained above for recording with a portable VTR;
Step 5
Start and stop recording using the function buttons on the VTR.
- The REC/TALLY indicator in the viewfinder does not function.
- The return video and the playback picture cannot be monitored on the viewfinder screen.

Monitoring the VTR Picture and Audio Output

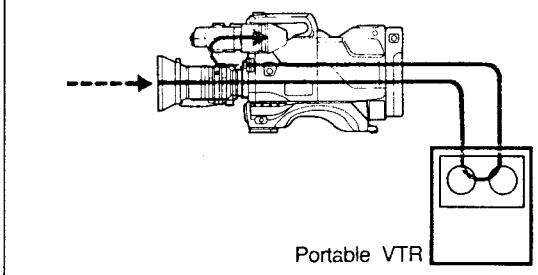
Monitoring the VTR Picture

You can see the following three types of images on the viewfinder screen when the camera and the VTR are connected with the CCQ camera cable. Note, however, that with some types of VTR, you may not be able to monitor a picture. (For more details on the pictures which can be seen on the viewfinder screen, see the "VTR Function Table" on page 1-23).

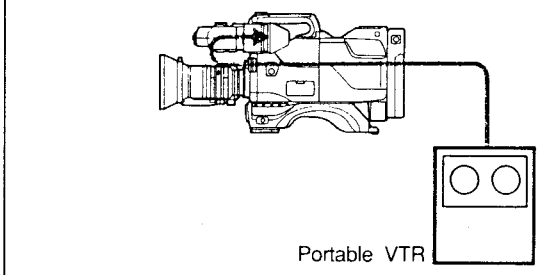
A picture picked up by the camera (during recording)



An E-E (return video) mode picture from the VTR (when the RET button on the lens is pressed during recording)



A playback picture (during playback)



Monitoring the Audio Output

You can monitor the audio signal during recording and reviewing by connecting an earphone to the EAR jack on the camera adaptor. Note, however, that with some types of VTR, you may not be able to monitor the audio output.

Noise on the Monitor

While the playback picture from the VTR displays on the viewfinder screen, some of the video signals output from the camera such as the sync signal, may mix with the playback picture so that streaks of noise roll horizontally or vertically across the screen.

Reading Indications in the Electronic Viewfinder

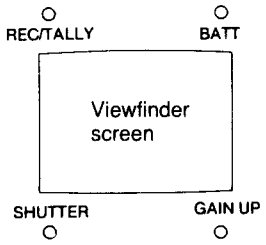
In the electronic viewfinder, the viewfinder screen itself shows you the settings of switches such as black/white balance and gain. At the periphery of the screen the viewfinder indicators show the status of operations such as battery level.

Reading Status Indicators on the Viewfinder

Four indicators (see illustration below) correspond to the status of the camera and connected equipment.
The illustration and table below show the location of the indicators on the periphery of the viewfinder screen and what they indicate.

The indicators are active or inactive depending on what is connected to the camera or what state the camera itself is in.

Viewfinder Screen and Status Indicators

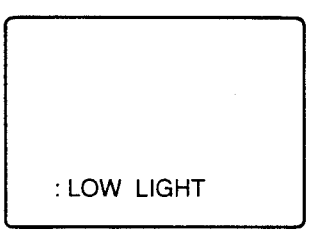


Indicator	Operates...	Flashes	Lights Continuously
REC/TALLY	While recording using a VTR connected with a CCQ cable	Until the VTR enters the standby mode	During recording
	While using a VTR (equipped with a warning system), which is connected with a CCQ cable	While the VTR is malfunctioning	—
	While using the CCU-M3/M3P	—	When a tally signal is transmitted from a video switcher, etc.
BATT	When the camera is powered by the battery pack	—	When the battery power becomes weak.
	When a VTR is connected to the camera	When the battery power becomes weak.	If you keep on operating the connected equipment after the indicator starts flashing.
	When the CCU is connected to the camera*		
SHUTTER	Any time	—	When the SHUTTER or CLEAR SCAN switch of the camera is set to ON.
GAIN UP	Any time	—	When the GAIN selector is set to 9 dB or 18 dB

* The indicator's flashing speed denotes the following:
  Slow: The battery is weak.
  Fast: The camera control units' switches and controls are being used.

Reading Warning Indications on the Viewfinder Display

Two indications, "LOW LIGHT" and "BATT. 10.7V" appear on the viewfinder display screen. The following explains what they mean and some possible remedies to the problems they indicate.



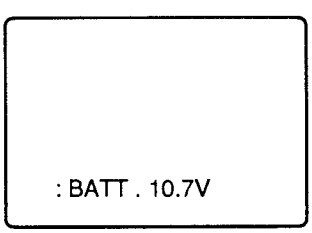
Meaning Lighting is insufficient.

Remedy
- Increase the ambient lighting.
- Open the iris manually or activate the automatic iris function.
- Select an appropriate filter.
- Set the GAIN selector to 9 dB or 18 dB.

It is possible to switch the "LOW LIGHT" indication on or off.

On: Press the UP/ON button when the character display is in the current camera setting (see next page) mode.

Off: Press the DOWN/OFF button when the character display is in the current camera setting (see next page) mode.



Meaning The input voltage to the camera is about 10.7 volts.

Remedy Replace the battery with a fully charged one.

If you continue recording with a weak battery, the quality of the recording will deteriorate.

Adjustments and Settings

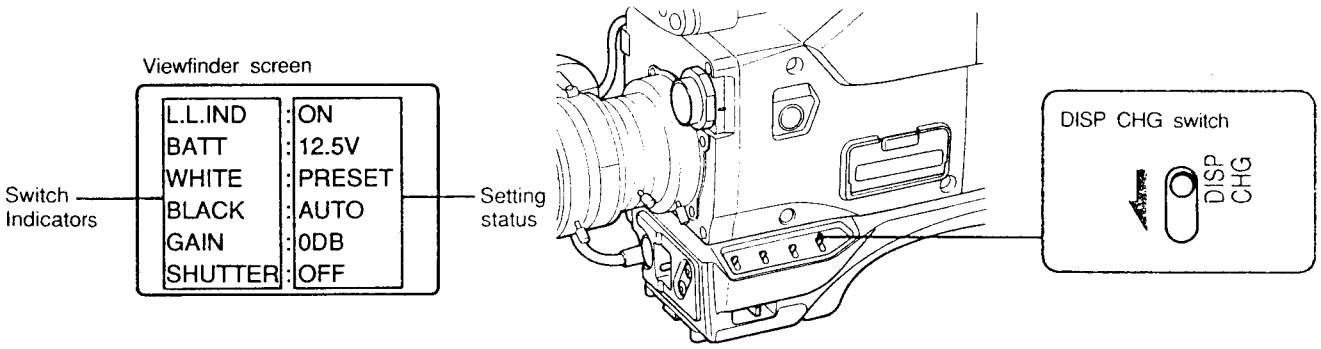
This section explains the screen display itself, the procedures for making adjustments to the current switch settings, the video monitor, and regular camera operations such as filter, iris, contrast and shutter speed settings.

Recognizing the Current Settings

The viewfinder screen shows you the settings of the switches on the camera head, camera adaptor, and zoom lens. If necessary, change the settings using the procedures described in this section and the table below.

Press the DISP CHG button several times until the following (see illustration below) display appears on the viewfinder screen.
The following table explains the meanings of the below screen display items.

Viewfinder Menu Display Items and Their Meanings



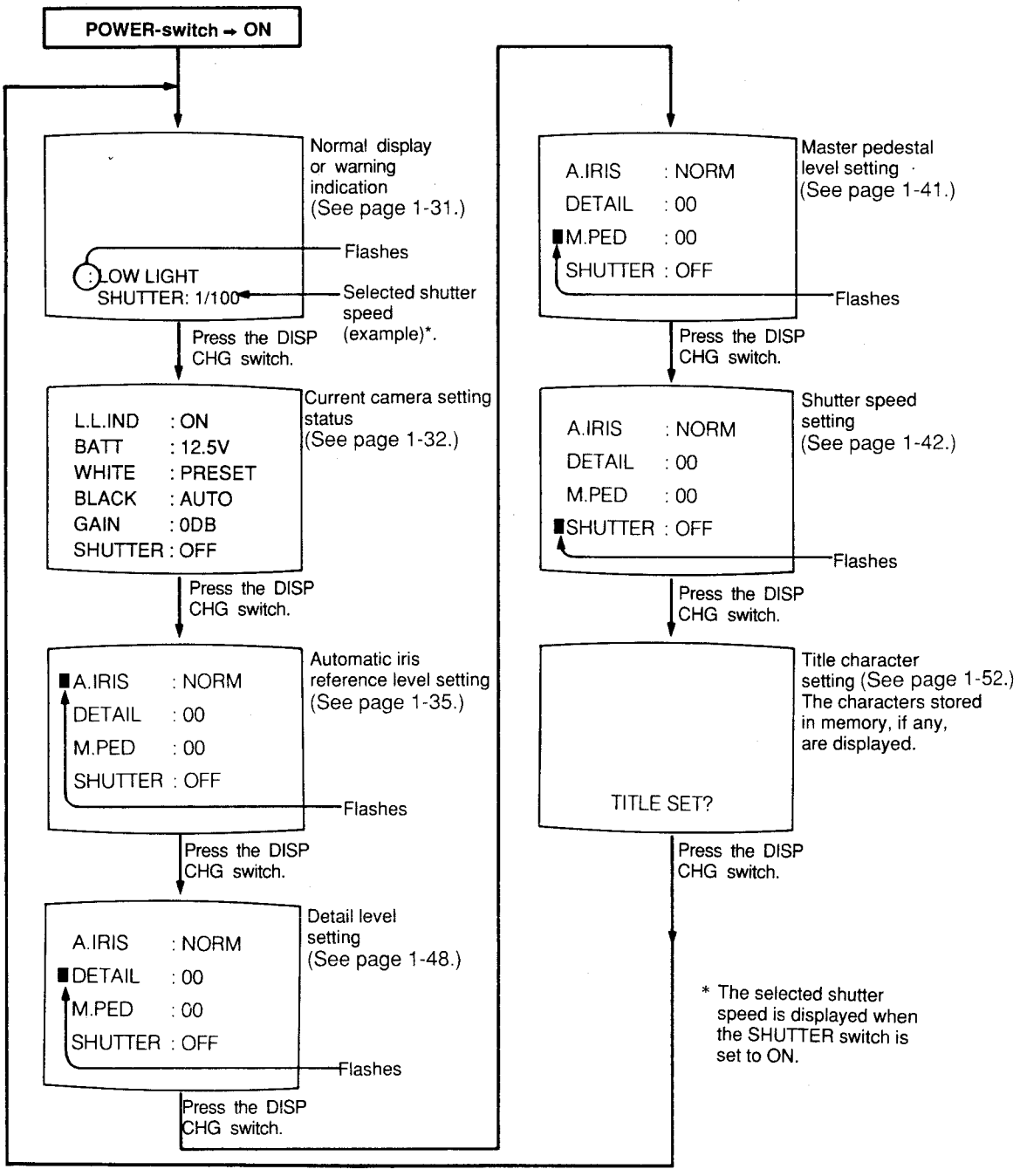
Switch Indicators	Meaning	Setting status	Meaning
L.L. IND	Setting the "LOW LIGHT" indication	ON	"LOW LIGHT" is displayed.
		OFF	"LOW LIGHT" is not displayed.
BATT	Battery voltage	XX.XV	The battery voltage level is displayed.
WHITE	White balance adjustment mode	PRESET	For the factory preset value
		AUTO/A or AUTO/B	For automatic adjustment. (The white balance has been adjusted automatically using the value stored in memory A or B.)
BLACK	Black balance adjustment mode	AUTO	For automatic adjustment
		MANUAL	For manual adjustment using the CCU-M7/ M7P, CCU-M3/M3P Camera Control Unit, or RM-M7G Camera Remote Control Unit
GAIN	Setting the video output level	0 dB, 9 dB, or 18 dB	The video output level is 0 dB, 9 dB or 18 dB.
		MANUAL	For manual adjustment using the CCU-M7/M7P, CCU-M3/M3P, or RM-M7G.
SHUTTER	Setting the shutter speed	OFF	The shutter speed cannot be changed.
		Shutter speed set	The set shutter speed is displayed.
C. SCAN	Clear Scan	XX.X Hz	The scanning frequency is displayed.

Reading the Viewfinder Screen Display Menu

The following chart shows how the display changes on the screen each time you press the DISP CHG switch.
In all modes, the black balance and white balance can be adjusted automatically.

The display mode changes to the black balance or white balance adjustment mode during adjustment and returns to the selected display after the adjustment is complete.

Order of Display Menus on the Viewfinder Screen


POWER-switch → ON
Normal display or warning indication (See page 1-31.)
Flashes
LOW LIGHT
SHUTTER: 1/100
Selected shutter speed (example)*.
Press the DISP CHG switch.
L.L.IND : ON
BATT : 12.5V
WHITE : PRESET
BLACK : AUTO
GAIN : 0DB
SHUTTER : OFF
Current camera setting status (See page 1-32.)
Press the DISP CHG switch.
A.IRIS : NORM
DETAIL : 00
M.PED : 00
SHUTTER : OFF
Automatic iris reference level setting (See page 1-35.)
Flashes
Press the DISP CHG switch.
A.IRIS : NORM
DETAIL : 00
M.PED : 00
SHUTTER : OFF
Detail level setting (See page 1-48.)
Flashes
Press the DISP CHG switch.
A.IRIS : NORM
DETAIL : 00
M.PED : 00
SHUTTER : OFF
Master pedestal level setting (See page 1-41.)
Flashes
Press the DISP CHG switch.
A.IRIS : NORM
DETAIL : 00
M.PED : 00
SHUTTER : OFF
Shutter speed setting (See page 1-42.)
Flashes
Press the DISP CHG switch.
TITLE SET?
Title character setting (See page 1-52.) The characters stored in memory, if any, are displayed.
Press the DISP CHG switch.
* The selected shutter speed is displayed when the SHUTTER switch is set to ON.

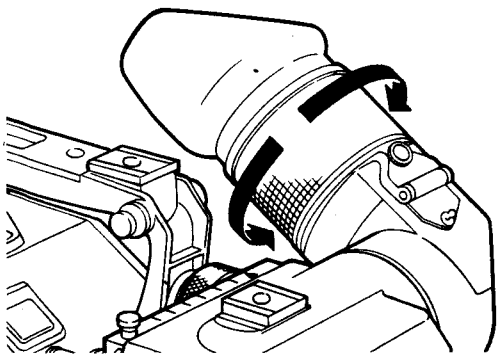
Each time you press DISP CHG the screen displays the above menus in the order indicated by the arrows.

Adjusting the Viewfinder Screen Display

After adjusting the viewfinder and the eye cup, make the following adjustments so that the viewfinder screen can be seen comfortably.
Note, however, that none of these settings affect the video output signal of the camera.

Adjusting the Diopter

Because the eye sight of each individual is different, it may be necessary to adjust the diopter when a new camera operator uses the viewfinder.



1	Focus the lens.
2	Turn the diopter ring (see illustration above) within the range of -1D to -3D until the view is clear.

Adjusting the Contrast and Brightness on the Viewfinder

1	Set the BARS switch on the camera to ON.
2	Adjust the contrast and brightness using the CONTR and BRIGHT controls on the viewfinder while referring to the color bar signals on the viewfinder screen.
3	Set the BARS switch to OFF after adjustment.

Adjusting the Sharpness on the Viewfinder

Set the PEAKING switch on the viewfinder to ON.
The image on the viewfinder screen sharpens so that the lens can be focused easily.

Adjusting the Video Monitor

When you are using a color video monitor to monitor the video output, adjust the color on the monitor using the procedure that follows. (See the section, "Connecting an S-VHS Format Portable VTR" on page 1-16 for information on how to connect a video monitor and a VTR.)

1	Set the BARS switch to ON.
2	Adjust the color and hue controls on the monitor while viewing the color bars on the monitor screen.
3	Set the BARs switch to OFF.

Adjusting the Iris

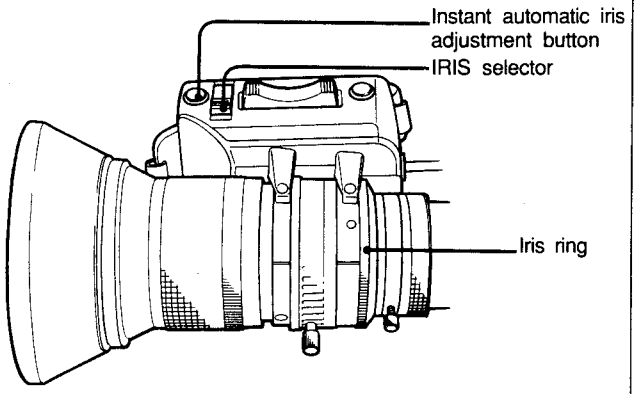
Automatic Iris Adjustment

Set the iris selector to "A." This is the normal setting for the automatic iris.
This setting makes the iris automatically adjust to the brightness of the object being shot.

Adjusting the Iris Manually

Use manual adjustment when recording an object against a bright sky or a scene with high contrast.
Set the IRIS selector to "M."

Temporary Automatic Adjustment



1 To automatically adjust the iris while the IRIS selector is set to "M", keep the Instant Automatic Iris Adjustment (IAIA) button depressed.

2 To fix the iris value that was set in Step 1, release the IAIA button. The iris remains fixed at this value until it is manually adjusted again.

Using the Zebra Pattern for Iris Adjustment

The Zebra Pattern appears on the portion of the screen where the video output is about 70 to 80 IRE (NTSC) or 490 to 560 mV (PAL). This pattern acts as a reference when you manually adjust the iris. (For the procedure, see "Checking the Video Level," page 1-49.)

Selecting the Automatic Iris Reference Level

When adjusting the video level of a back-lit subject, you can change the automatic iris reference level setting. When you make the setting, it is retained in the memory of the camera.

The selectable values are as follows:

- –1.0
- –0.5
- NORMAL (reference value)
- 0.5
- 1.0

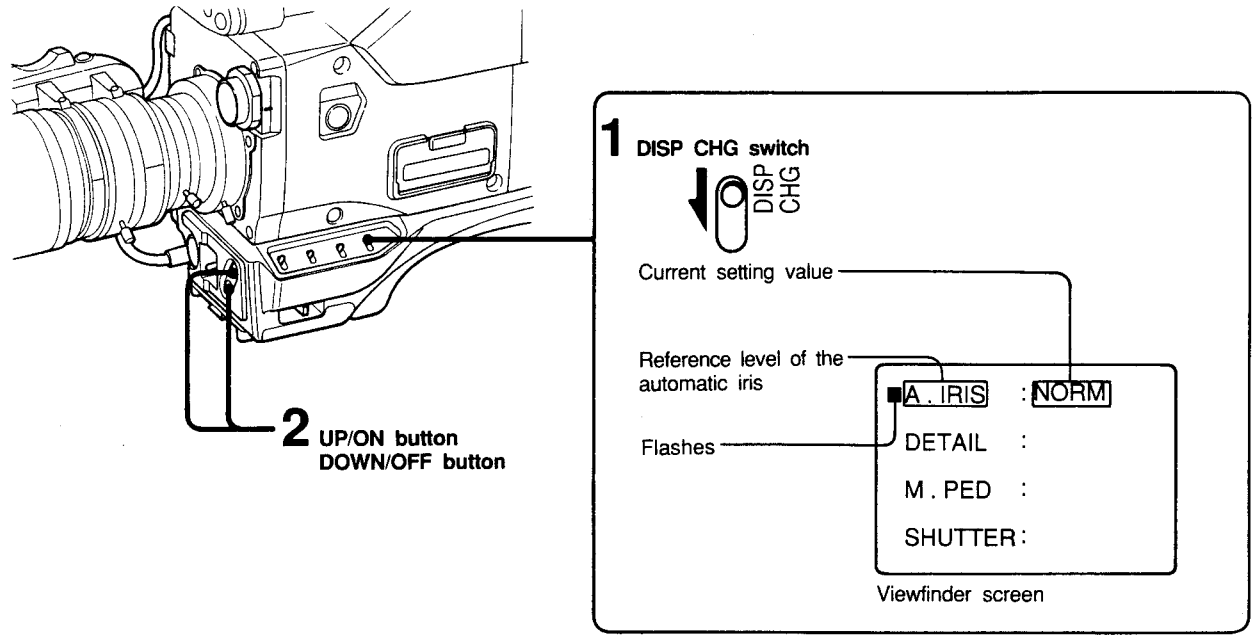
1 To select the automatic iris reference level, press the DISP CHG switch several times until the following (see the illustration on the next page) display appears on the viewfinder screen.

2 Select the setting value (from –1.0 to 1.0).
To raise the value
Press the UP/ON button
To lower the value
Press the DOWN/OFF button
To Reset to NORMAL
Press the UP/ON and DOWN/OFF buttons simultaneously

Note

When you connect the CCU-M7/M7P, CCU-M3/M3P Camera Control Unit, or RM-M7G Camera Remote Control Unit to the camera, change the automatic iris reference level using the controls on the CCU-M7/M7P, CCU-M3/M3P, or RM-M7G. The controls on the camera do not operate this function.

Menu Display and Automatic Iris Reference Level Setting



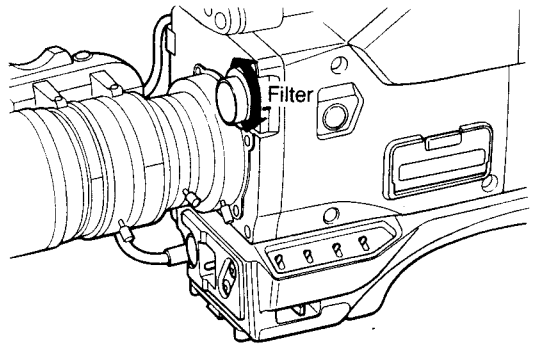
Selecting the Filter

The color temperature changes according to lighting conditions. To compensate for this, use one of the color temperature conversion filters indicated in the table below. Turn the dial (see illustration below) to the correct filter number.

Color Temperature Conversion Filter Table and Filter Dial on the Camera

Filter number	Color temperature	Lighting conditions
1	3200K	Iodine lamp, sunrise, sunset
2	5600K + 1/4 ND*	Bright outdoor
3	5600K	Cloudy, rainy
4	5600K + 1/16 ND	Exceptionally bright scenes, beach in summer, snow fields in winter

* ND: Neutral Density



Filter selector

When the selected filter does not suit the lighting conditions

A warning such as "LOW LIGHT" displays on the viewfinder screen if you have selected the wrong filter for the lighting. (For details on warnings, see "Reading Warning Indications on the Viewfinder Screen Display," on page 1-31.)

Using an ND Filter

Exceptionally bright scenes such as a sunny day at the beach or snow-covered terrain will look "washed out" when videotaped. To videotape these scenes naturally, use an ND filter and set the FILTER selector to the "4" position.

Use the above table as a guide for selecting the correct filter.

Adjusting the Black Balance

Adjust the black balance to ensure picture clarity and life-like color reproduction.
When adjusting the black balance, adjust the black set simultaneously. The adjusted black balance value is retained in the memory of the camera and you need not re-adjust it later except for the following cases:

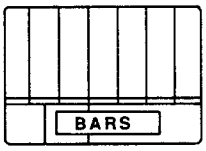
Re-adjust the black balance if

- "MEMORY NG" appears on the viewfinder screen
- the camera has not been used for a long time
- the ambient temperature has changed radically

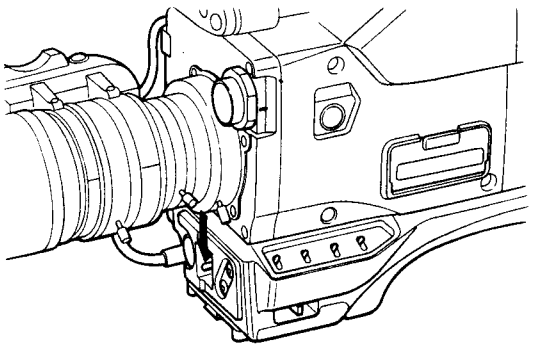
Doing the Black Balance Adjustment

Before You Begin

Set the camera so that the normal video signal outputs. If the video camera is outputting a color bar signal, you cannot adjust the black balance. If you try to do so, the viewfinder screen displays the following message over the color bars:



"BARS" Message and Color Bars



1 **To adjust the black balance, flip the AUTO W/B/BAL switch to the BLK position (see above).**
When the W/B BALANCE switch on the camera control unit is set to MANUAL, you cannot adjust the black balance from the camera.

2 **When you hear a click, release the switch.**
"AUTO BLACK -OP-" appears on the viewfinder screen during adjustment, and "AUTO BLACK -OK-" appears on the viewfinder screen when adjustment is complete.
The iris closes if the IRIS selector is set to "M". To open it again, you must open it manually.

If black balance cannot be done

The characters shown below are displayed on the viewfinder screen.

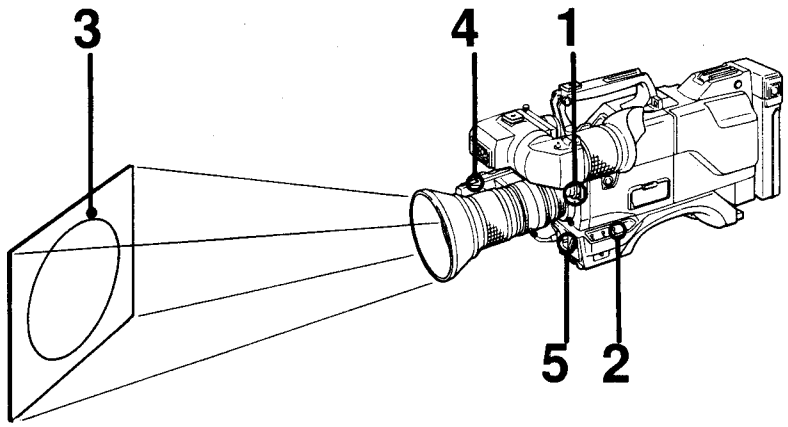
Black Balance Error Message

AUTO BLACK
— NG —
IRIS:
NOT CLOSED
TRY AGAIN

The above message means that the iris was not closed during black balance adjustment. This may occur when the lens connector is not connected correctly, or when some trouble occurs on the lens.

Adjusting the White Balance

The white balance should be adjusted so that a white object is reproduced as white and life-like color is obtained. The white balance changes depending on the lighting conditions.
The camera has two memories, A and B, in which to store the adjusted white balance values. You can store two adjusted values under two different lighting conditions and recall either of the values according to ambient conditions.

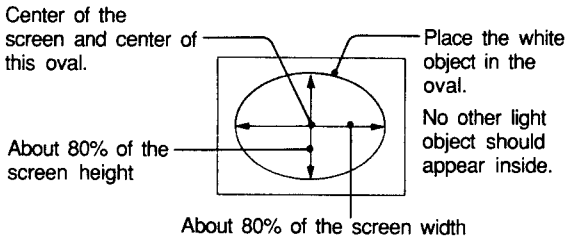


If "MEMORY NG" appears in the viewfinder screen readjust the white balance.

1 Select the position of the FILTER selector on the camera head according to lighting conditions.

2 Set the WHITE BAL selector to "A" or "B".

3 Zoom up on a white object such as a white cloth or paper with the same lighting conditions as those for shooting. The minimum white area required for adjustment is as follows:


Center of the screen and center of this oval.
About 80% of the screen height
Place the white object in the oval.
No other light object should appear inside.
About 80% of the screen width

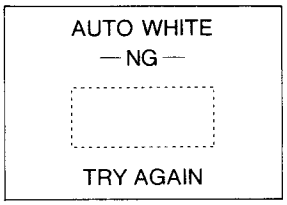
4 Set the IRIS selector on the lens to "A".

5 Press the AUTO W/B/BAL switch to the WHT position. When you hear a click, release the switch. "AUTO WHITE -OP-" appears on the display screen during adjustment, and "AUTO WHITE -OK-" appears on the viewfinder screen when adjustment ends. The camera stores the adjusted white balance value in the selected memory.

When the white balance cannot be done

The following characters appear on the screen display if white balance cannot be done. Re-adjust the white balance after taking the measures required in the chart below.

White Balance Error Messages

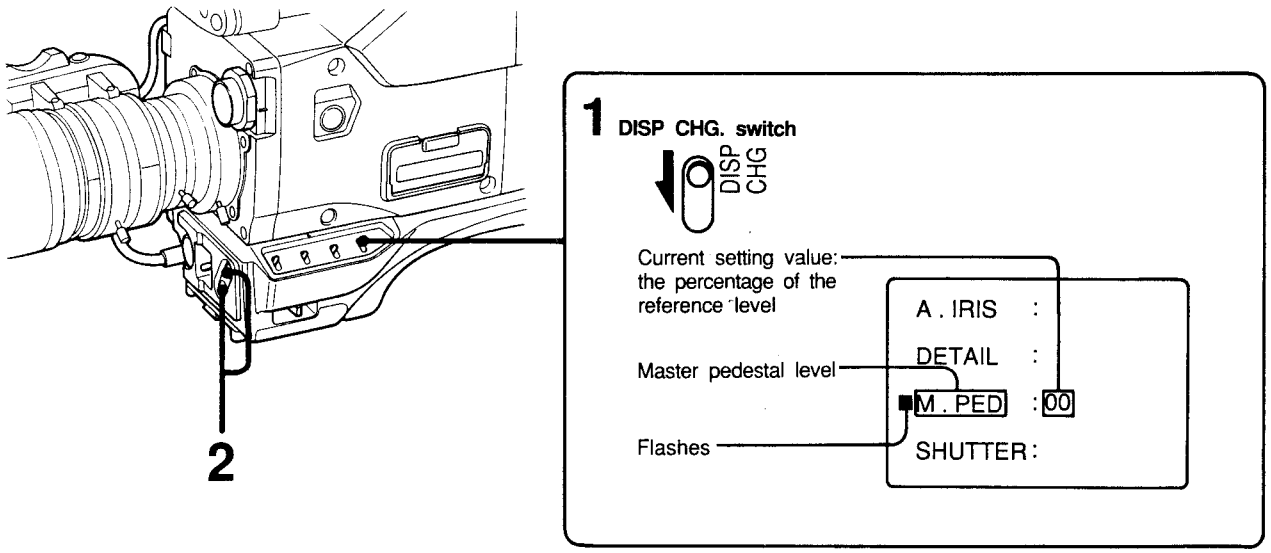


Display	Causes and measures
LOW LIGHT	Light is insufficient. Add illumination or raise the video output level with the GAIN selector.
??	The object is not white or very bright light appears in the picture. Change the object to an appropriate one.
C. TEMP. LOW CHG. FILTER	Color temperature is too low. Select the appropriate filter with the FILTER selector.
C. TEMP. HI CHG. FILTER	Color temperature is too high. Select the appropriate filter with the FILTER selector.
WHITE: PRESET	When the WHITE BAL selector is set to the PRE position. Set to the A or B position.
WHITE: MANUAL	When the CCU is connected, and the manual white balance adjustment is selected on the CCU. Select to the automatically adjust.
BARS	When the color bar signal is output. Set the OUTPUT switch to "CAM" position.

Adjusting the Contrast

To adjust the contrast, change the pedestal level. When the master pedestal level is raised, the dark portion of the picture brightens, and when the level is lowered, the corresponding portion darkens. You can change the level from about –30% to +30% of reference level (0.7 V) in increments of 1%. The adjusted master pedestal level is kept in the memory of the camera.

Adjusting the Contrast



1 Press the DISP CHG switch several times until the display above appears on the viewfinder screen.

2 Change the master pedestal.

To raise the level
Press the UP/ON button on the camera head.
To lower the level
Press the DOWN/OFF button on the camera head.
To reset the level to the reference level
Press the UP/ON and DOWN/OFF buttons simultaneously.

On setting the master pedestal level
If the CCU-M7/M7P, CCU-M3/M3P Camera Control Unit is connected to the camera, set the master pedestal level from the CCU or RM-M7G Camera Remote Control Unit.

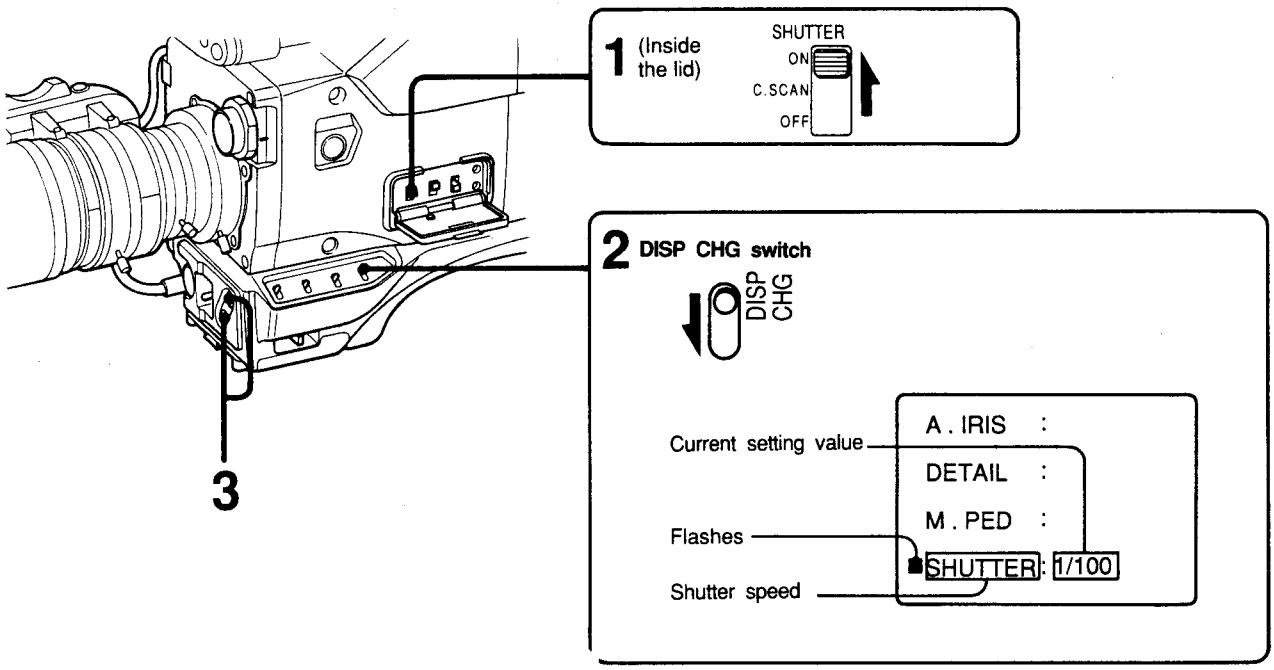
Selecting the Shutter Speed

The shutter speed is factory set to 1/100 for NTSC and 1/60 for PAL. You can change the shutter speed if necessary. Select the shutter speed from the following:

For NTSC: 1/100, 1/250, 1/500, 1/1000, 1/2000
For PAL: 1/60*, 1/250, 1/500, 1/1000, 1/2000.

Your selection is retained in the memory of the camera.

Selecting the Shutter Speed



1 To change the shutter speed, set the SHUTTER switch on the camera head to ON.

2 Press the DISP CHG switch several times until the display above appears on the display screen.
If the SHUTTER switch is set to OFF, "OFF" appears at the current setting value.

3 Select the shutter speed.

To increase the shutter speed value
Press the UP/ON button on the camera head.
To decrease the value
Press the DOWN/OFF button on the camera head.
To reset the value to 1/100 (for NTSC) or 1/60 (for PAL)
Press the UP/ON and DOWN/OFF buttons simultaneously.

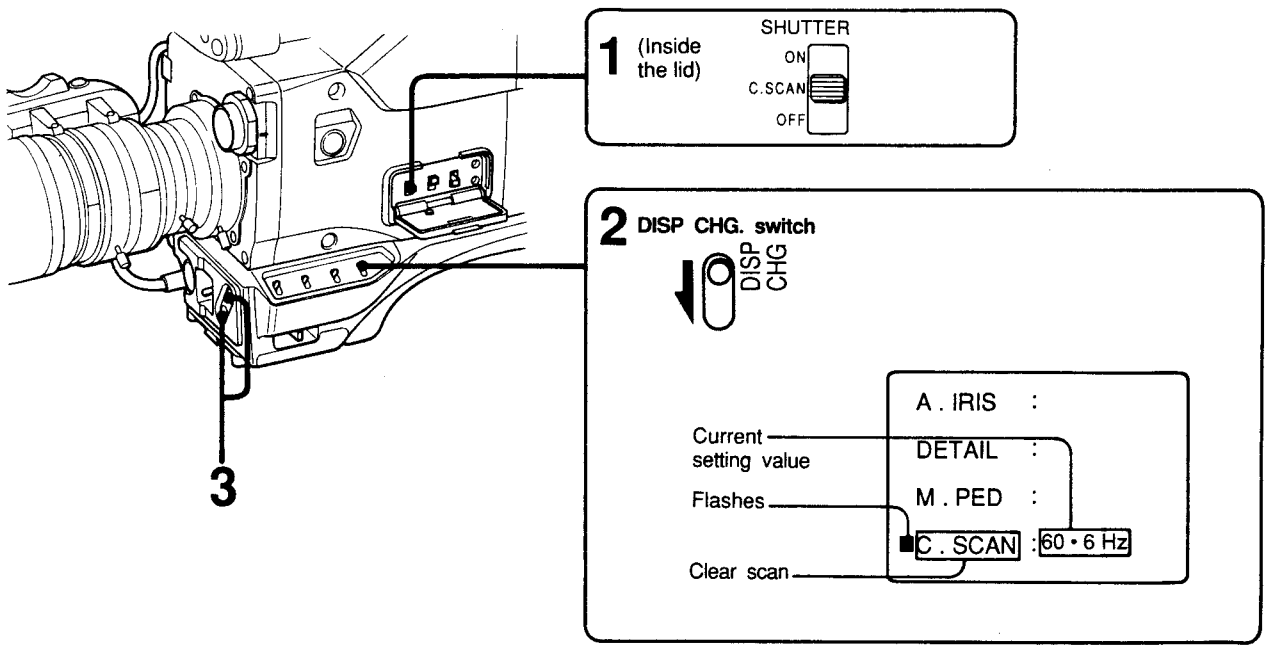
*When you are using the RM-M7G to control the camera, the 1/100 setting on the RM-M7G sets the camera shutter speed to 1/60 and "1/60" appears on the screen display in the viewfinder. This is to prevent flickering when you are shooting a CRT screen.

Using the Clear Scan Function

The Clear Scan function decreases the slant noise when you are shooting a computer screen using this camera. This is necessary since the scanning speed of the computer differs from that of the camera.
While watching the monitor or viewfinder screen, you can adjust for slant noise by pressing the UP/DOWN button for the appropriate frequency listed below (displayed in Hz).

NTSC 60.4 to 101.1 Hz
PAL 50.3 to 101.1 Hz

Using the Clear Scan Function to Decrease Slant Noise



1 Set the CLEAR SCAN switch on the camera to ON.

2 Press the DISP CHG switch until the above screen appears in the viewfinder display.

3 Change the setting value.

To increase the Clear Scan setting value
Press the UP/ON button on the camera.
To decrease the value
Press the DOWN/OFF button on the camera.
To reset to the minimum value
Press the UP/ON and DOWN/OFF buttons at the same time.

The amount the frequency changes by each press is not the same. The displayed frequency is the approximated frequency.
The frequency you have selected is stored in the memory of the camera and is retained even after the power is turned off.
When the CCU-M7/M7P,CCU-M3/M3P, or RM-M7G is connected, change the Clear Scan frequency using the UP/DOWN button on the camera.

Note on the scanning frequency difference
The scanning frequency of CRT monitors differs among brands. Therefore, even with the Clear Scan, the noise may not decrease remarkably in some cases. The frequency may change depending on the software running on the computer at the time. Readjust the frequency in this case. Use the following recommended frequencies to help you:

Apple Macintosh*II series	66.7 Hz
IBM PS/2* series (720 x 400)	70.1 Hz

* Macintosh is a trademark of Apple Computer Inc. and PS/2 is a registered trademark of International Business Machines Corporation.

Advanced Operations

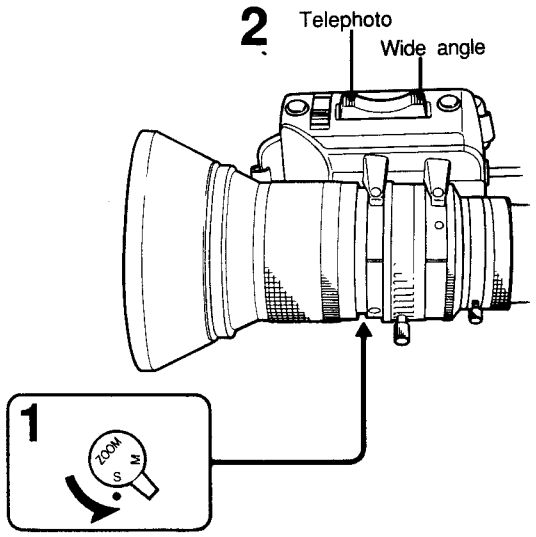
The following section explains procedures for using the zoom lens, adjusting the picture output, adjusting output levels, and synchronizing two or more cameras superimposing title characters.

Doing Close-Ups and Wide-Angle Shots

You can go from wide angle to telephoto shots by using the motorized zoom or doing the zoom manually.

Motorized Zoom

The Lens with Zoom Attached



1 Set the ZOOM selector to the "S" (servo) position.

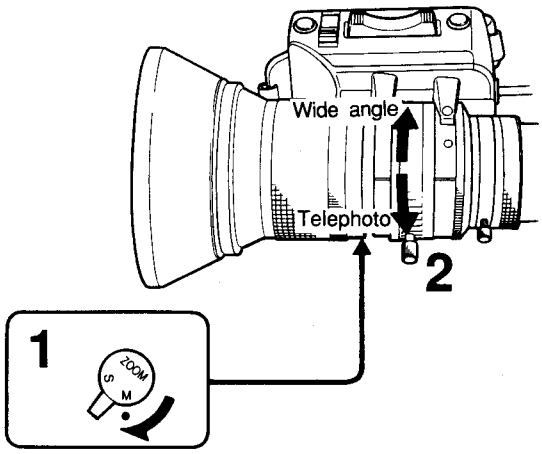
2 Press either end of the motorized zoom switch.

To zoom faster, press all the way down on the motorized zoom switch. Press the switch lightly to zoom more slowly.

Manual Zoom

Manual zoom allows more precise control over the zooming speed.

Setting Wide Angle and Telephoto Zoom



1 Set the ZOOM selector to the "M" (manual) position.

2 Position the Manual zoom lever to the appropriate angle.

Tips on Using the Zoom

Correct Focusing
If the subject is in focus in the telephoto position, it will remain in focus when you zoom back to wide angle.

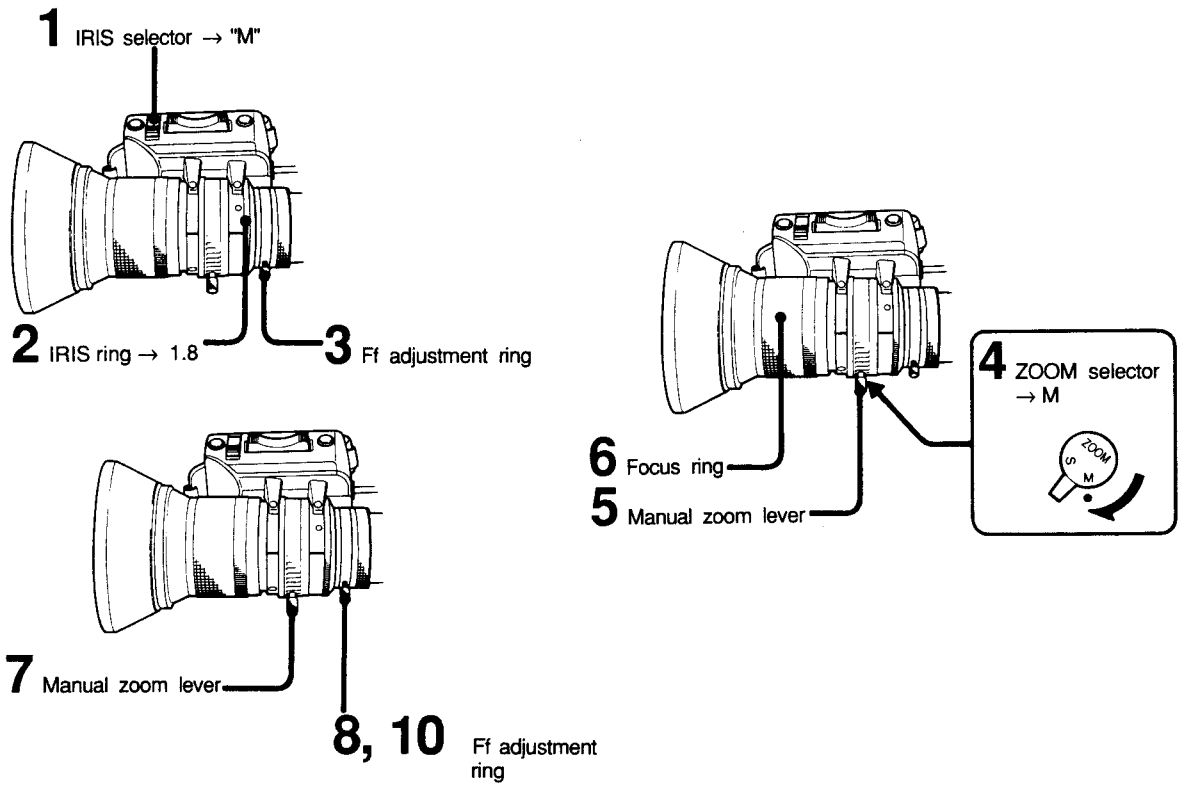
For a more stable picture
We recommend placing the camera on a tripod when using the zoom. If you zoom with the camera on your shoulder, stand as steadily as possible.

Positioning the object at the center of the screen
For zoom-in, adjust the focus in the telephoto position, and set to the wide angle position. Then start to zoom in. Make sure that the object stays at the center of the screen while you are using the zooming.

Keeping the Shot in Focus — Adjusting the Focal Flange Length

The proper flange length adjustment ensures that the object is in focus both at the wide-angle and telephoto position when using the zoom. Once you have made the flange focal length adjustment, you do not have to re-adjust the lens as long as the lens stays on the same camera.

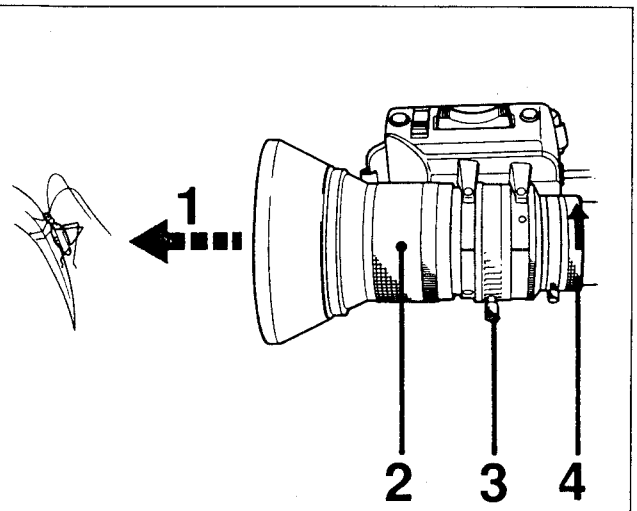
Adjusting the Focal Flange


1 IRIS selector → "M"
2 IRIS ring → 1.8
3 Ff adjustment ring
4 ZOOM selector → M
6 Focus ring
5 Manual zoom lever
7 Manual zoom lever
8, 10 Ff adjustment ring

1 To adjust the focal flange, set the IRIS selector to M.	**6** Turn the focus ring until the chart is in focus at about three meters (10 feet) from the lens.
2 Set the iris ring to 1.8. Position the supplied chart for iris adjustment and illuminate the chart so that the proper video level is reached when the iris ring is at 1.8.	**7** Turn the manual zoom lever to 9.5, wide-angle position.
3 Loosen the screw on the Ff adjustment ring.	**8** Turn the Ff adjustment ring and focus on the chart used in Step 6.
4 Set the ZOOM selector to M.	**9** Repeat Steps 5 through 8 until the chart is in focus both at the telephoto position and at the wide-angle position.
5 Turn the manual zoom lever to 152, telephoto position.	**10** Tighten the screw on the Ff adjustment ring firmly.

Doing Close-Ups — Shooting Small or Nearby Objects

The Close-Up or Macro function on the DXC-537 series camera lets you zoom in tightly on flowers, insects, and even photographs without distortion. The minimum distance from the lens to the object is 70 mm ($2^{7}/_{8}$ inches) in the 9.5 wide-angle zoom position.



1	Adjust the distance between the lens and the object to get the desired image size.
2	Set the focus ring to the ∞ (infinity) setting.
3	Turn the MACRO ring until it stops while pushing the button in the direction of the MACRO arrow.
4	Focus on the object by turning the manual zoom lever with the ZOOM selector set to M.
5	When the close-up operation is complete, return the MACRO ring to its original position.

If you want to reduce the object's size on screen

1	Follow Steps 1 through 4 above.
2	Turn the MACRO ring slightly toward its original position and adjust the focus with the manual zoom lever again.

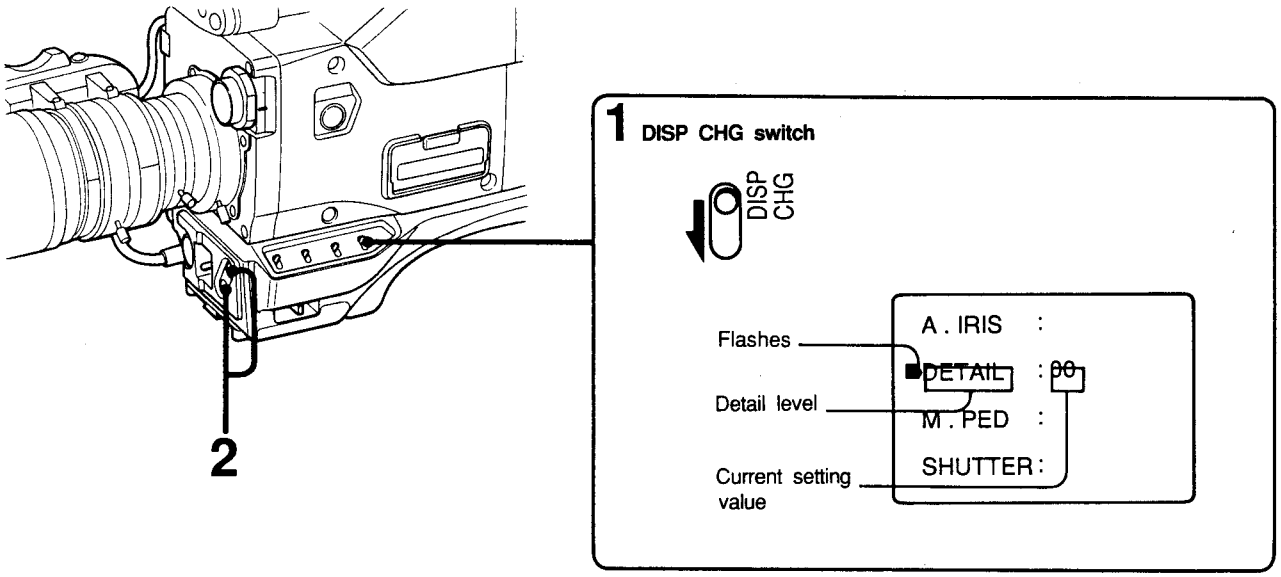
Note on the Focus Ring

If the focus ring is set to ∞ (infinity) while the MACRO ring is turned to "MACRO," the focus can be continually adjusted from the close-up position to ∞ (infinity) with the manual zoom lever.

Adjusting the Sharpness of the Picture

You can increase (harden) or decrease (soften) the sharpness of the picture. Change the value of the detail level to increase or decrease the sharpness. The detail level can be set from –99 to +99 of the factory-set reference level (00).

Changing the Value of the Detail Level



1 Press the DISP CHG switch several times until the above display appears on the viewfinder.

2 Change the value of the detail level.

To increase the value
Press the UP/ON button on the camera head.
To decrease the value
Press the DOWN/OFF button on the camera head.
To reset the value to the reference level
Press the UP/ON and DOWN/OFF buttons simultaneously.

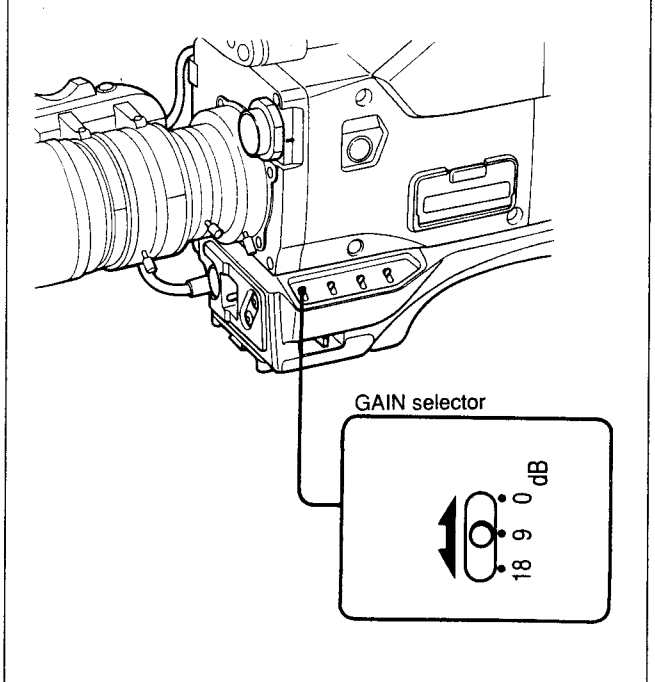
If you increase the video output level when you increase the detail level, the noise in the picture increases.

When using the RM-M7G
When the RM-M7G Camera Remote Control is connected to the camera, the detail level can be changed from the RM-M7G.

Selecting the Output Level

If you cannot get a clear picture because of insufficient light, set the GAIN selector to a higher or lower position. (The GAIN selector is normally set to "0 dB".)
The video output level can be raised by 9 dB by setting the GAIN selector to "9 dB" and by 18 dB by setting the selector to "18 dB".

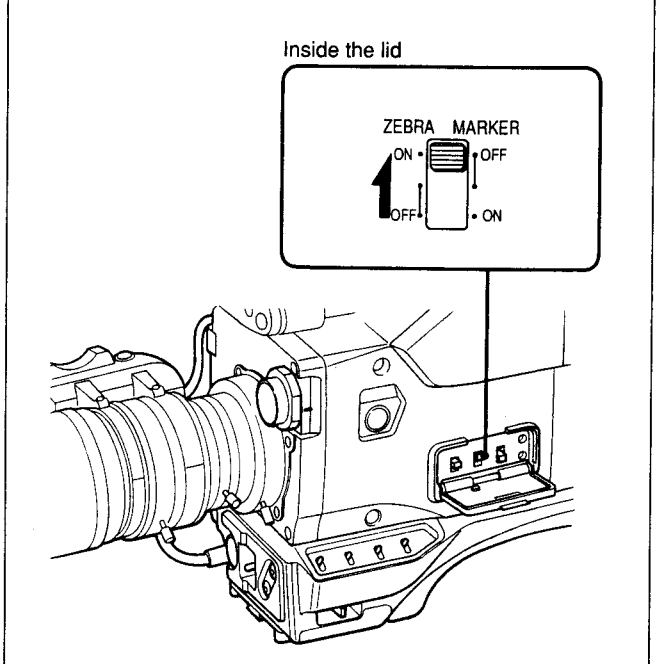
Setting the Gain Selector



Checking the Video Level

Use the zebra pattern (generated by the camera) as a reference when adjusting the iris manually. The zebra pattern indicates areas of the picture where the video level is approximately 70% to 80% (for NTSC) or 490 mV to 560 mV (for PAL):
When the ZEBRA switch is set to ON, a zebra pattern appears on the part of the viewfinder screen where the video output level is 70 to 80 IRE or 490 to 560 mV.
Adjust the iris so that the zebra pattern appears over the subject being shot (for example, the face of a back-lit person).
If it is not necessary to use the zebra pattern to adjust the iris, set the ZEBRA switch to OFF.

Setting the Zebra Switch



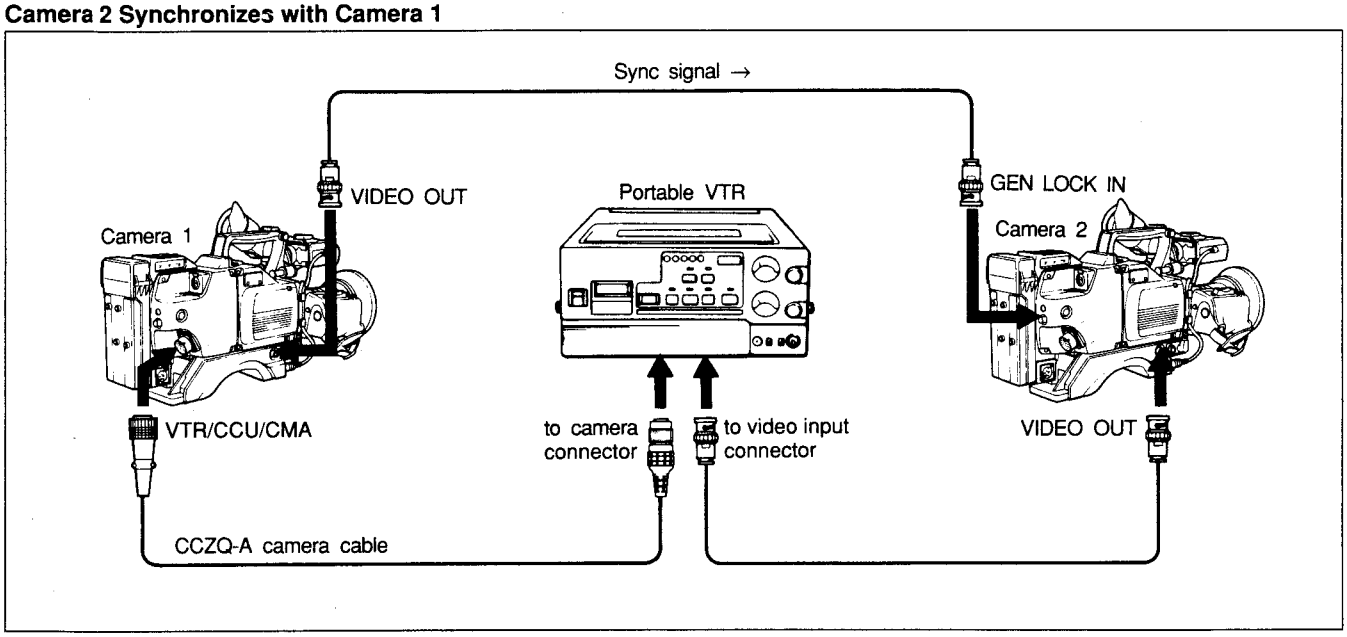
Synchronizing Two or More Cameras (Without Using a Camera Control Unit)

When a BS or VBS signal is connected to the GEN LOCK IN connector on the camera adaptor, the camera synchronizes with the connected signal. Use the GEN LOCK IN connector when you are using two or more cameras without a camera control unit. (See the illustrations below for sample connections.)

Connecting Two Cameras or More Cameras to a VTR

The illustration below gives an example of how to connect two cameras with a VTR.

Camera 2 Synchronizes with Camera 1

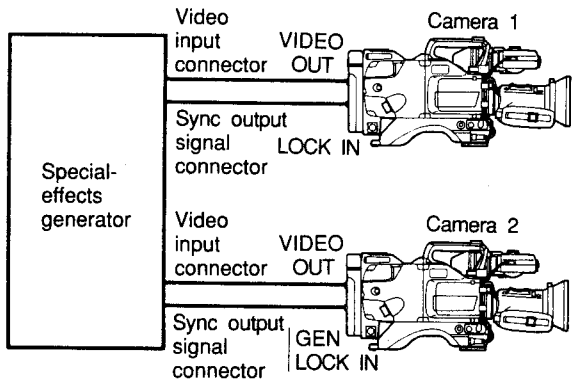


Connecting Two or More Cameras and a Special-Effects Generator

When two or more cameras are used simultaneously in connection with a special-effects generator, supply each camera with the same reference signal and adjust each camera to get the same picture tone. Adjust the SC (subcarrier) phase and the H (horizontal) phase following the procedures and illustration described below.

1	Do a rough subcarrier phase adjustment using the SC phase selector.
2	Make the fine adjustment using the SC PHASE control and a vectorscope.
3	Adjust the horizontal phase using the H PHASE control and a waveform monitor or oscilloscope.

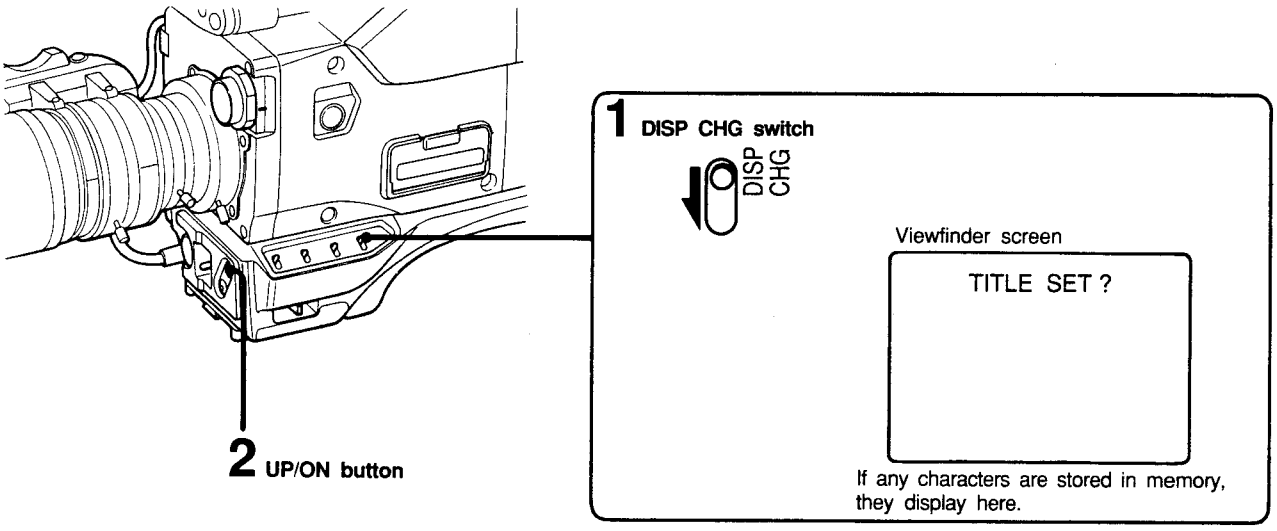
Camera 1 and Camera 2 Synchronize with a Special-Effects Generator



Setting Title Characters Through the Viewfinder

This camera contains a built-in character generator that allows you to superimpose characters over the picture being shot. Both the picture and the superimposed characters appear on the monitor screen. If a recording VTR is connected to the camera, the superimposed characters can be recorded on the VTR.

Preparation



1 Press the DISP CHG switch several times until the above indication appears on the viewfinder display screen.

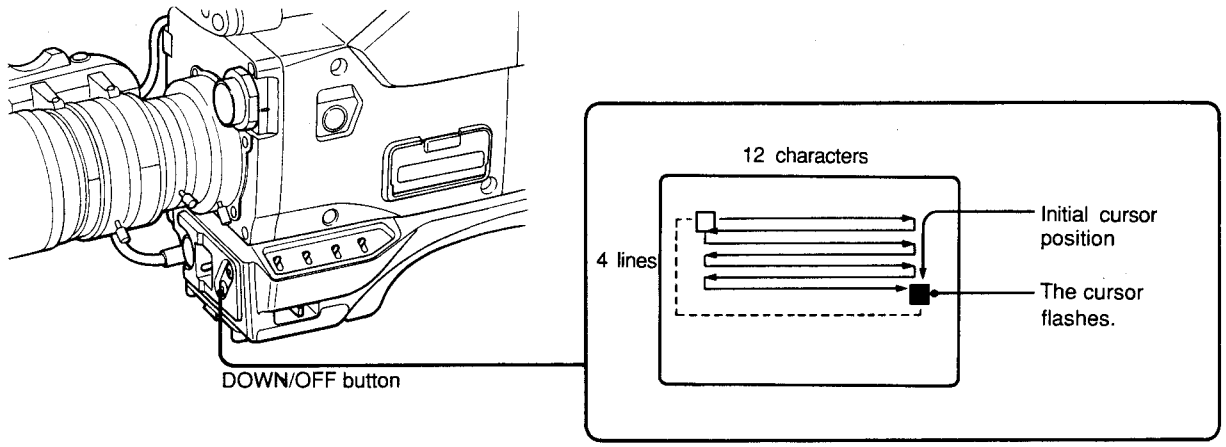
2 To put the camera into the title setting mode, press the UP/ON button.

To clear all the memorized characters
Press the UP/ON and DOWN/OFF buttons at the same time.

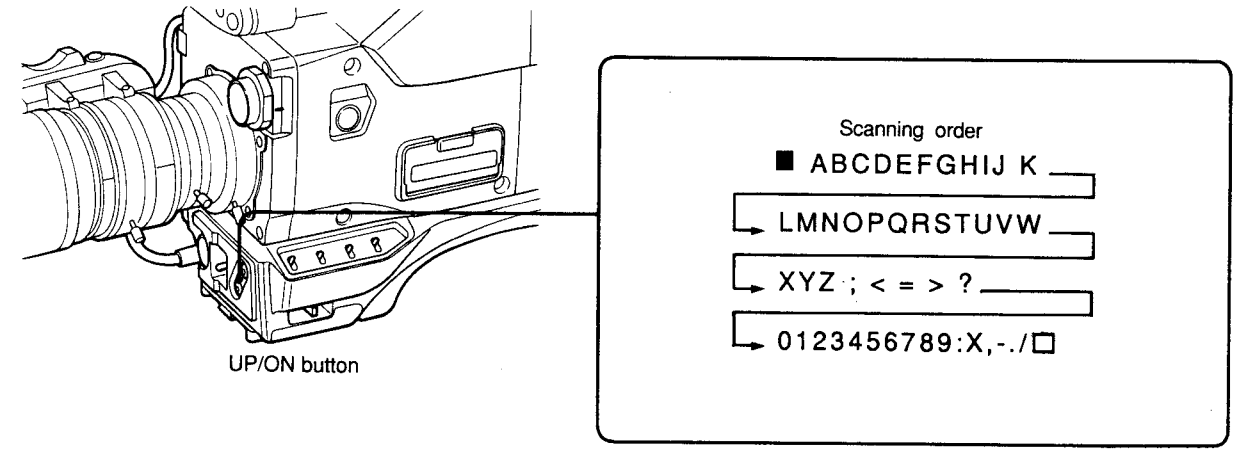
Character Setting procedures

Set title characters one by one choosing them from the display using the UP/ON and DOWN/OFF buttons. Up to 12 characters can display on one line. Up to 4 lines can be displayed. Title characters, once set, remain in the memory of the camera, and are not erased when the power is turned off.

Moving the cursor



Setting Title Characters



1 To set characters and letters from the display, press the UP/ON button repeatedly until the cursor flashes on the character you want to set.

To change the characters in reverse alphabetical order
While pressing the UP/ON button, press the DOWN/OFF button.

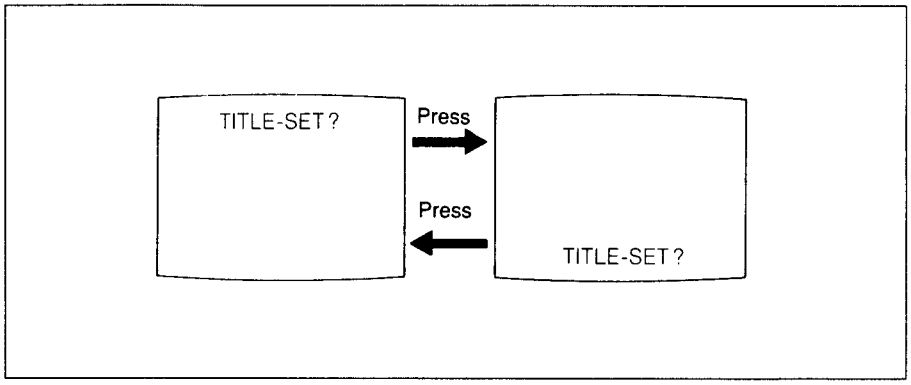
2 Press the DOWN/OFF button to set the selected character.
The cursor moves one space to the right.

3 Repeat the above steps 1 and 2 to set all the characters.

To move the cursor to the right
Press the DOWN/OFF button repeatedly to move the cursor.

To move the cursor to the left
While pressing the UP/ON button, press the DOWN/OFF button repeatedly.

To replace a character
Return the cursor to the position of the character you want to replace, select the desired character with the UP/ON button, and press the DOWN/OFF button. The characters must be changed one by one as described in the above procedure.



To change the position of the title characters
Press the DOWN/OFF button.

When Using a VO-8800/8800P Portable VTR
If you are using a VO-8800/8800P Portable VTR, do not use the upper character display area because the VTR tape remaining time shows here. Use only the lower character display area.

To exit character setting mode
Press the DISP CHG switch.

The Next Time You Use the Camera

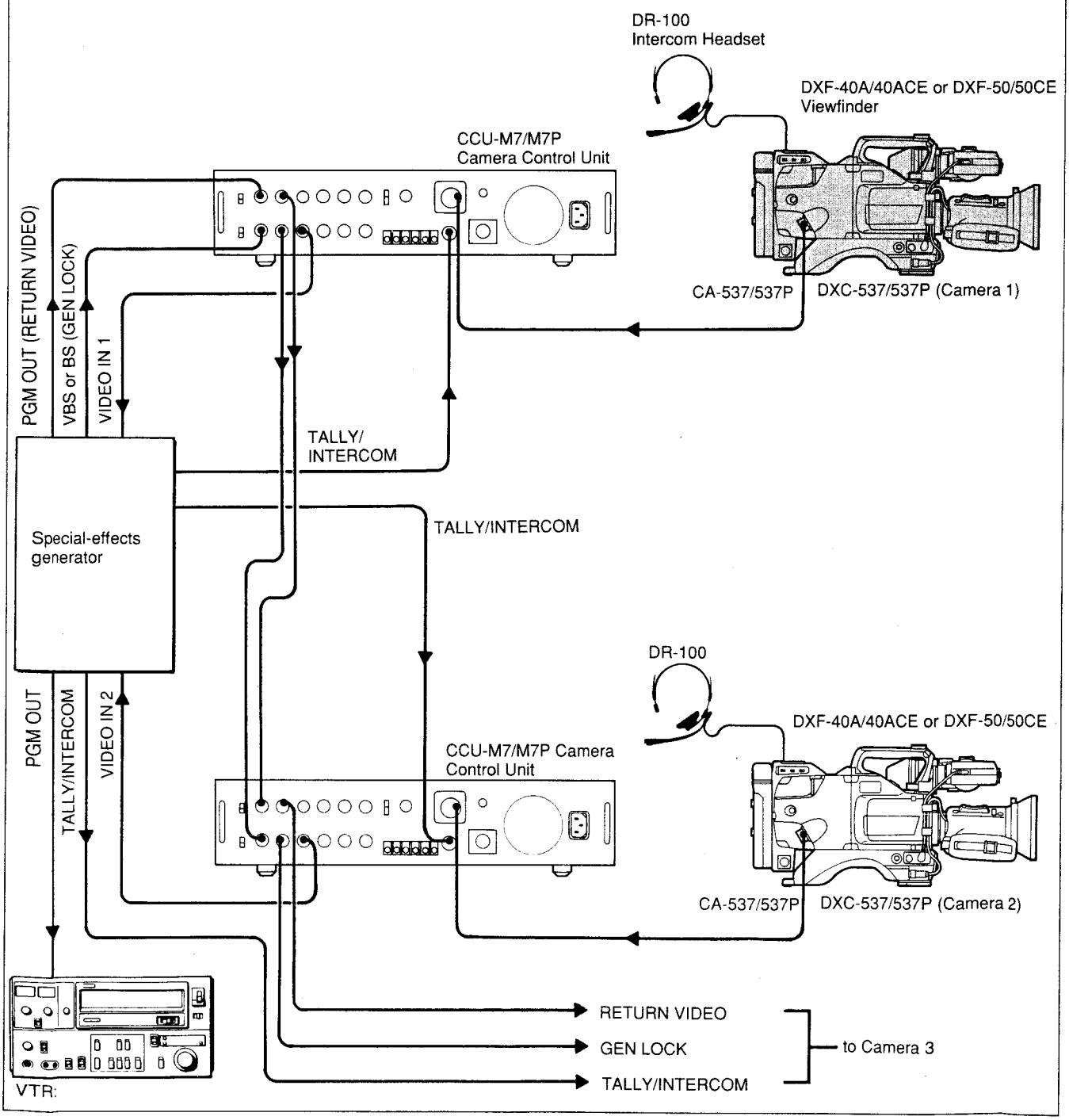
When you turn on the camera, the memorized characters display on the viewfinder screen at step 1 of "Preparation" (see page 1-52). To display the characters on the monitor screen and output them to the VTR, press the UP/ON button.

Using the Camera in a Studio

When you are using more than two cameras simultaneously in a video studio, you need a special-effects generator, such as the Sony SEG-2550A, to do wipe effects and switching between equipment. You also need a CCU-M7/M7P Camera Control Unit to match picture quality and color between cameras (see "Connecting a Camera Control Unit" on page 1-20).

Refer to the illustration below for how to connect the above mentioned and other optional equipment.

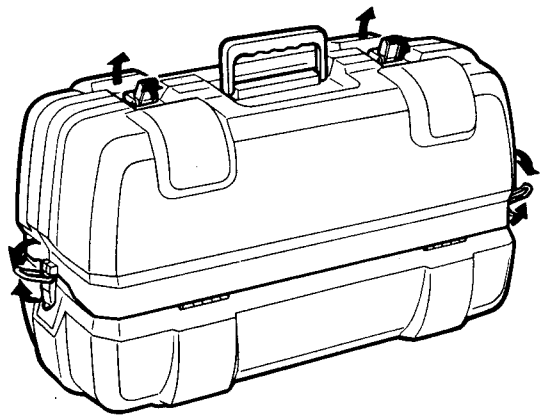
Connecting a Special-Effects Generator and a CCU for Studio Use



Handling the Carrying Case

Opening the Carrying Case

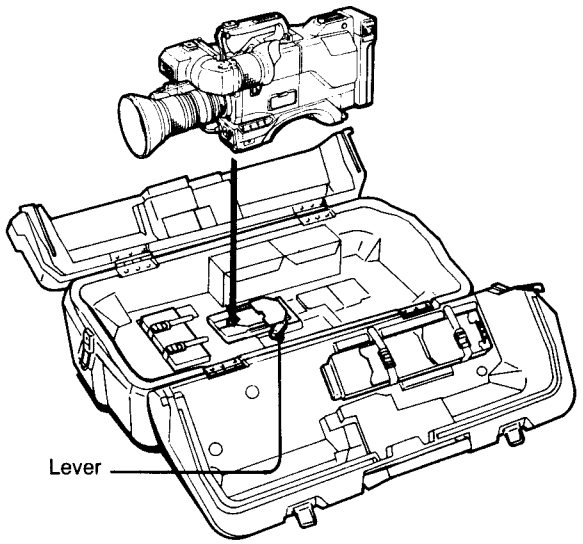
To open the camera carrying case, release the four catches at the edge of the case, then open the case from the upper part.



Packing the Camera in the Case

1 Align the camera to the attachment on the bottom of the case.

2 Slide the camera forward and fasten the camera to the case.



1-4. COLOR VIDEO CAMERA OVERVIEW

Optional Accessories and Recommended Equipment

Lens and Accessories
Zoom lens: VCL-916BY
Lens remote control unit: LO-23
Tripod attachment: VCT-14

Camera Adaptor
Camera adaptor: CA-537/537P, CA-327/327P, CA-511/325A/325AP/325B
Camera adaptor: CMA-8A/8ACE
Camera remote control unit: RM-M7G

VTR
Hi8 format video cassette recorder: EVV-9000/9000P
Portable video cassette recorder: VO-8800/8800PS
Betacam SP Portable Recorder: BVW-35/35P
SP-Umatic video cassette recorder: BVU-150/150P

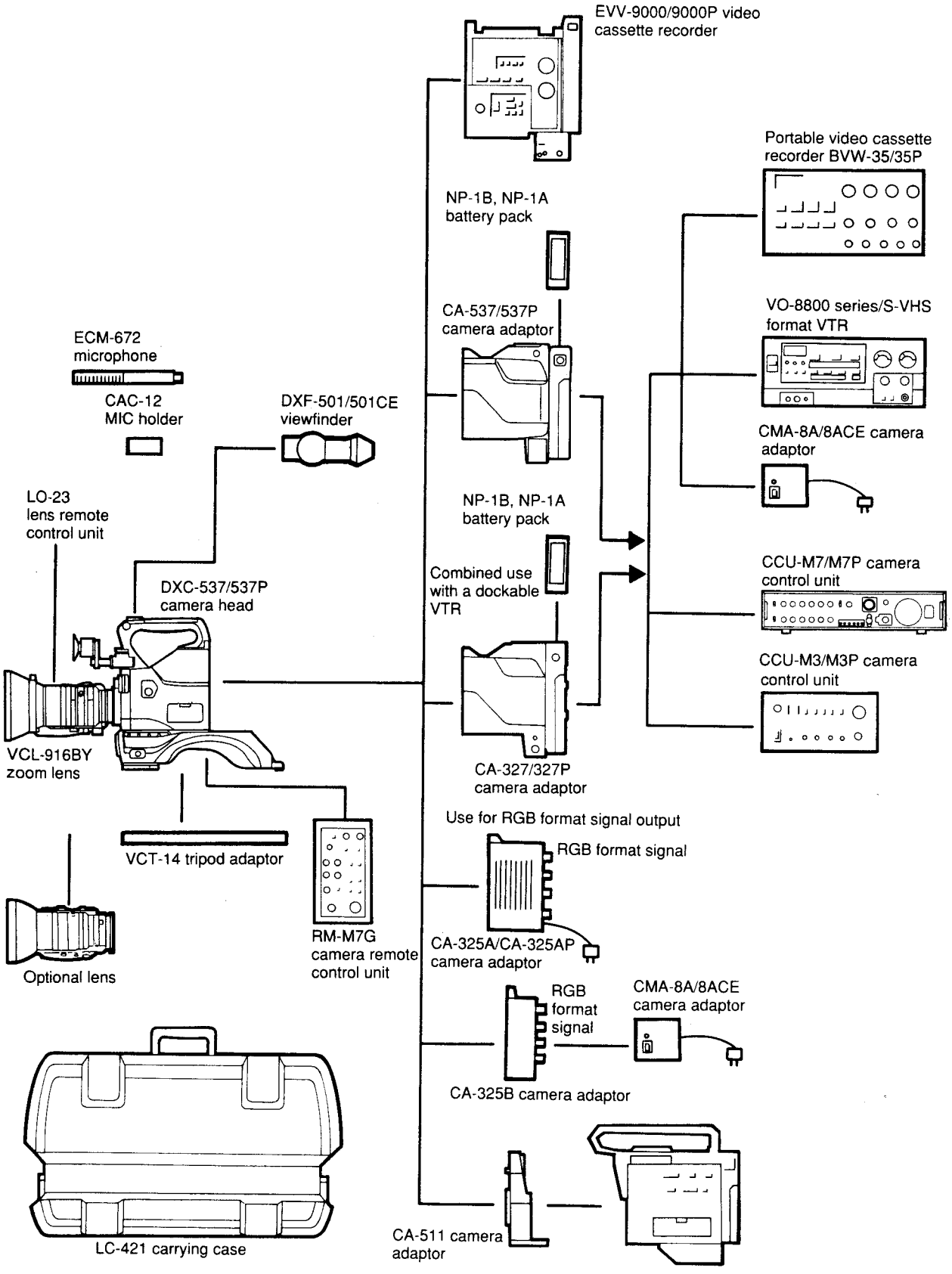
Battery Pack and Charger
Battery pack: NP-1B, NP-1A
Battery charger: BC-1WB, BC-1WA

Microphone and Accessories
Condenser microphone: ECM-672, C74
Microphone holder: CAC-12
Microphone cable: EC-0.5C2

Equipment for Studio Use
Camera control unit CCU-M7/M7P
Camera control unit: CCU-M3/M3P
Special-effects generator: SEG-2550/2550P
Universal chroma keyer: CRK-2000
Wipe pattern extender: WEX-2000/2000P
Electronic viewfinder: DXF-50/50CE
Electronic viewfinder: DXF-40A/40ACE
Electronic viewfinder: DXF-501/501CE
Intercom headset: DR-100
Rack mounting metal: RMM-1800

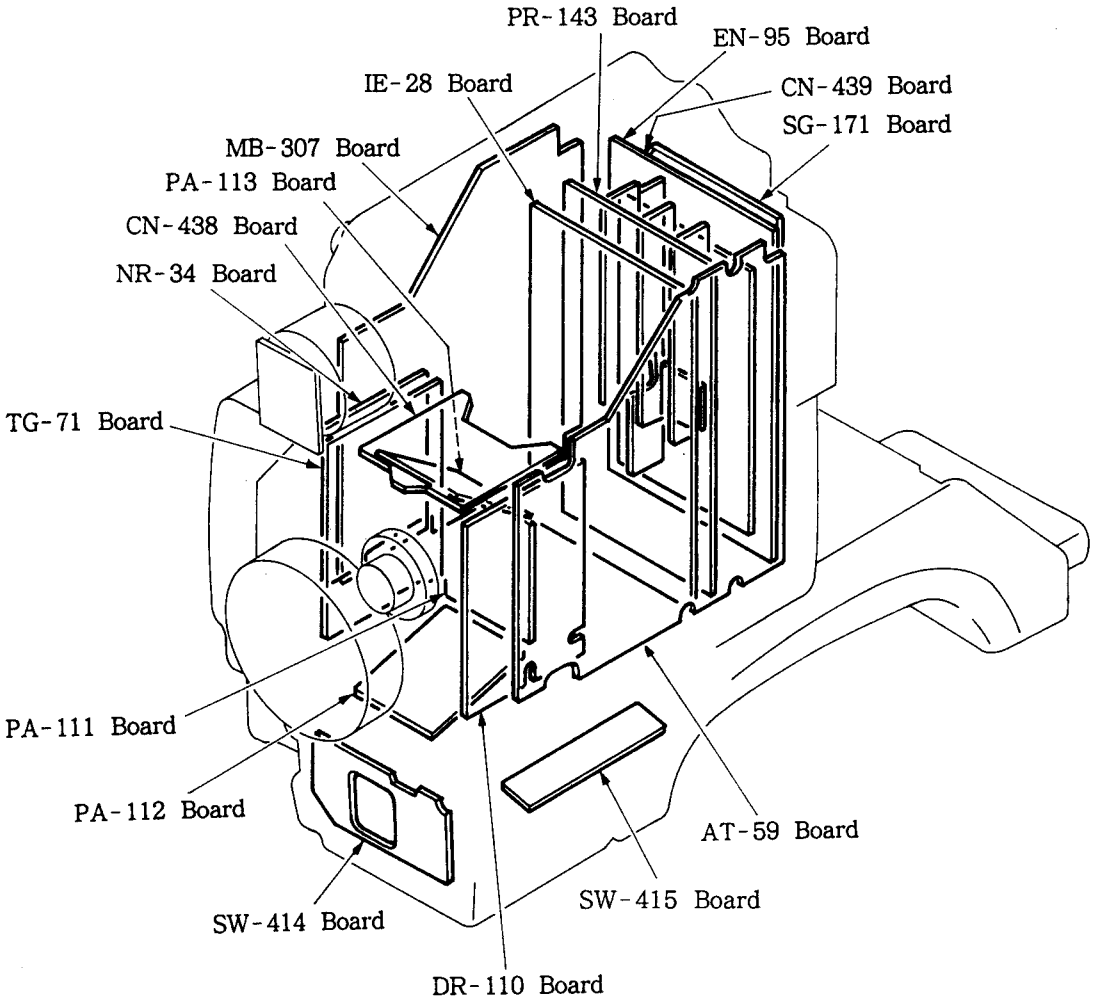
Camera Cable and Others
Camera cable with Z-type 26 pin connector:
CCZ-A2, CCZ-A5, CCZ-A10
CCZ-A25, CCZ-A50, CCZ-A100
Camera cable with Z-type 26 pin and Q-type 14 pin connector:
CCZQ-A2, CCZQ-A5, CCZQ-A10
CCZQ-A2AM
Camera cable with Q-type 14-pin connector: CCQ-2BRS, CCQ-5BRS, CCQ-10BRS
Camera cable with Q-type 14-pin connector: CCQ-10AM, CCQ-20AM, CCQ-50AM, CCQ-100AM
Camera cable with Z-type 26-pin and J-type 10-pin connectors: CCZJ-2
Cable extension adaptor:
CCZZ-1B, CCZZ-1E
Carrying case: LC-421
Camera rain cover: LCR-1

Sample Video System Configuration



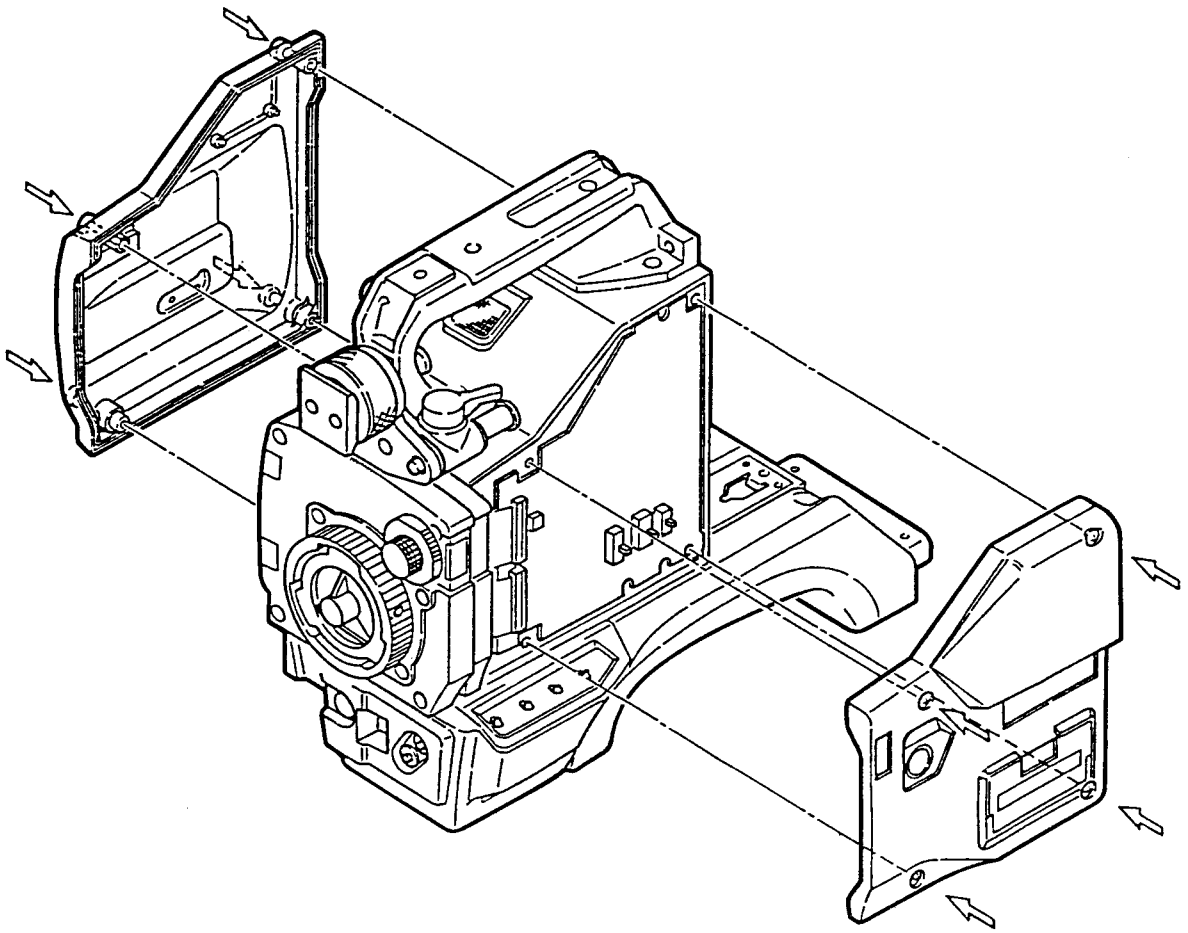
SECTION 2
SERVICE INFORMATION

2-1. BOARD LAYOUT



2-2. REMOVAL OF CABINET

Loosen the four screws to remove each side cover.

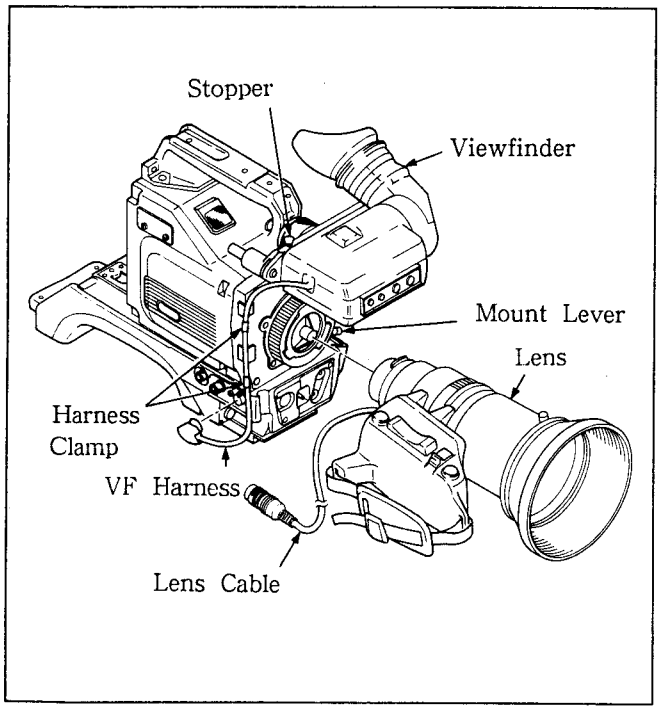


2-3. REPLACEMENT OF MAIN PARTS

2-3-1. Replacement of CCD Unit

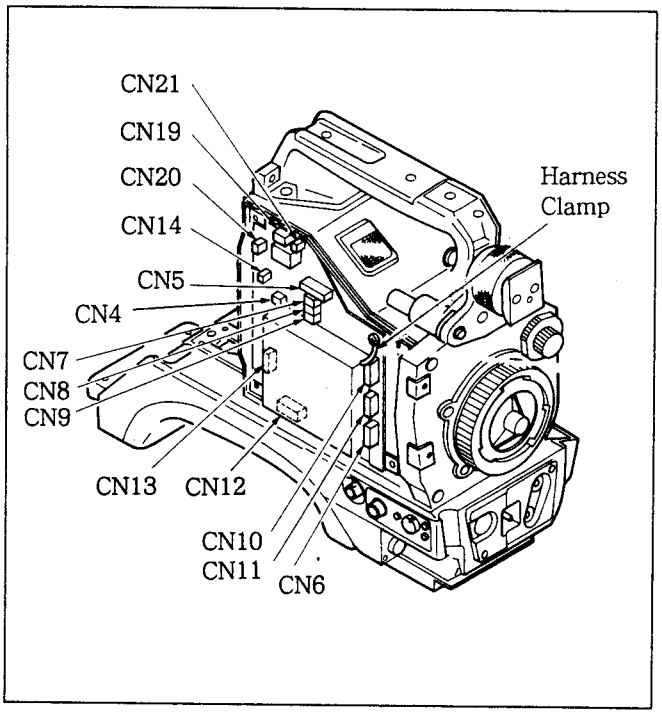
Note : When replacing the CCD block, replace it together with the CCD unit.

1. Remove the lens and lens cable. Then, release the VF harness from the harness clamp.
   Note : Do not remove the front cap.

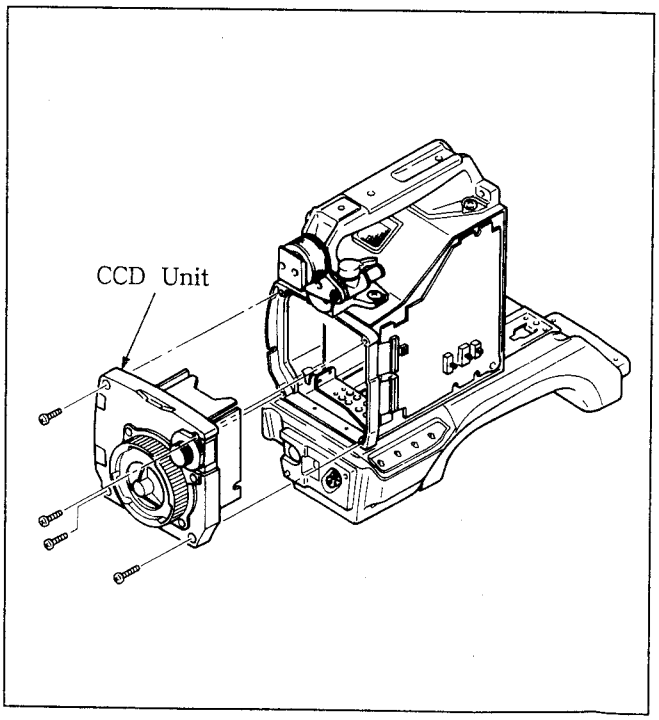


2. Remove the left side panel assembly, referring to Section 2-2 "REMOVAL OF CABINET"

3. Disconnect the seven connectors CN4, CN5, CN6, CN7, CN8, CN9, and CN21, on the MB-307 board. Release the harness from the harness clamp.



4. Remove the four screws of the CCD unit and pull out the CCD unit.



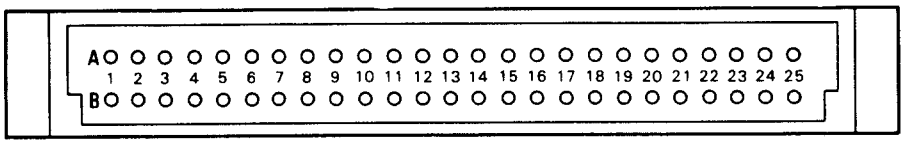
2-4. CONNECTORS AND CABLES

2-4-1. Connector Input /Output Signals

The main connector input/output signals are as follows :

VIDEO OUT (BNC) ; 1.0Vp-p ± 0.1V, sync negative 75 Ω

CAMERA/CA (50P)



(EXIT VIEW)

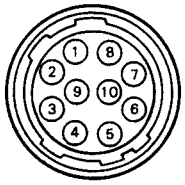
Pin No.	Signal	Specification
A 1	MODE ID	OPEN:COMP, GND:R/G/B
B 1	GND(CHASSIS)	
A 2	MIC(Y) OUT	−60dBm
B 2	MIC(X) OUT	
A 3	MIC(G) OUT	
B 3	(SPARE)	
A 4	REC TALLY IND IN	Zi≧600Ω
B 4	(SPARE)	
A 5	VTR START/STOP OUT	
B 5	(SPARE)	
A 6	(SPARE)	
B 6	(SPARE)	
A 7	(SPARE)	
B 7	(SPARE)	
A 8	GENLOCK VIDEO(G) IN	Zi≧1kΩ
B 8	GENLOCK VIDEO(X) IN	
A 9	SYNC(G) OUT	H :4.0～5.5Vp-p :negative L :0±0.4Vdc Zo≦2kΩ
B 9	SYNC(X) OUT	
A10	PB RET VIDEO(G) IN	Zi≧10kΩ
B10	PB RET VIDEO(X) IN	
A11	COLOR FRAMING PULSE	H :4.0～5.5Vp-p Zo≦2kΩ L :0±0.4Vdc
B11	VF VIDEO CONT IN	CAM:OPEN Zi≧1kΩ, PB:0V
A12	VBS(G) OUT	1.0Vp-p, negative sync Zo=75Ω±5%
B12	VBS(X) OUT	
A13	VTR SAVE CONT OUT	STBY:4.0～5.5Vp-p Zo≦100Ω SAVE:0±0.25V
B13	VTR/CCU CONT OUT	VTR :0±0.25V Zo≦1kΩ CCU :5.0±0.5V

Pin No.	Signal	Specification
A14	CHROMINANCE(G) OUT	NTSC:0.286Vp-p±10% PAL :0.300Vp-p±10% Zo≦75Ω±5%
B14	CHROMINANCE(X) OUT	
A15	LUMINANCE(G) OUT	1.0Vp-p, negative sync. Zo≦75Ω±5%
B15	LUMINANCE(X) OUT	
A16	VIDEO GND OUT	R/G/B 1.4Vp-p, positive Zo≦75Ω±5% component out *1
B16	R/R-Y VIDEO OUT	
A17	G/Y VIDEO OUT	
B17	B/B-Y VIDEO OUT	
A18	BATT ALARM/S. DATA	
B18	REC REVIEW CONT OUT	GND;rec review
A19	(SPARE)	
B19	(SPARE)	
A20	+8.5V OUT	8.3V～9.1V
B20	+5V OUT	±0.1V
A21	−5V OUT	±0.1V
B21	GND	REG, GND
A22	POWER +12V DC IN	10.6V to 17.0Vdc
B22	POWER +12V DC IN	
A23	POWER +12V DC GND	GND for ±12Vdc
B23	POWER +12V DC GND	
A24	(SPARE)	
B24	(SPARE)	
A25	GND(CHASSIS)	CHASSIS GND
B25	GND(CHASSIS)	

*1

	J	UC	EK
Y	0.714 Vp-p	0.714 Vp-p	0.700 Vp-p
R-Y	0.756 Vp-p	0.700 Vp-p	0.525 Vp-p
B-Y	0.756 Vp-p	0.700 Vp-p	0.525 Vp-p

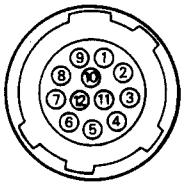
REMOTE (10P, FEMALE)



(EXIT VIEW)

Pin No.	Signal	Specification
1	(SPARE)	
2	VBS(RM)(X)	1.0Vp-p, sync negative
3	VBS(RM)(G)	
4	(SPARE)	
5	VTR START/STOP IN	Zi≧10kΩ ⊔ −OPEN(4.5±0.5V) −0±0.5V
6	S. DATA(X)	0 to 5V Zi≧10kΩ
7	S. DATA GND	GND for S. DATA
8	REC TALLY IND OUT	Zi≧600Ω
9	POWER +12V DC GND	GND for +12Vdc
10	POWER +12V DC OUT	10.6V to 17.0Vdc

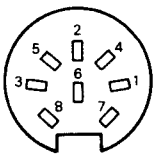
LENS (12P, FEMALE)



(EXIT VIEW)

Pin No.	Signal	Specification
1	VF VIDEO CONT IN	ON:0±0.5Vdc
2	VTR START/STOP IN	TRIG:0±0.5V
3	POWER +12V DC GND	GND for +12Vdc
4	COMPULSORY AUTO IRIS CONT OUT	AUTO:4.5±0.5V MANU:0+0.5V or OPEN
5	IRIS CONT OUT	F16 :3.4Vdc F2.8:6.2Vdc
6	POWER +12V DC OUT	10.6V to 17.0Vdc
7	NC	———
8	NC	———
9	NC	———
10	NC	———
11	NC	———
12	NC	———

VF (8P, FEMALE)



(WIRING SIDE)

Pin No.	Signal	Specification
1	POWER +12V DC GND	GND for +12Vdc
2	REC TALLY IND OUT	Zo≦1.1kΩ
3	E. SHUTTER IND OUT	Zo≦1.1kΩ
4	VF VIDEO (G) OUT	GND for VF VIDEO
5	BATT IND OUT	Zo≦1.1kΩ
6	VF VIDEO (X) OUT	V=1Vp-p
7	POWER +12V DC OUT	10.6V to 17.0Vdc
8	GAIN UP IND OUT	Zo≦1.1kΩ

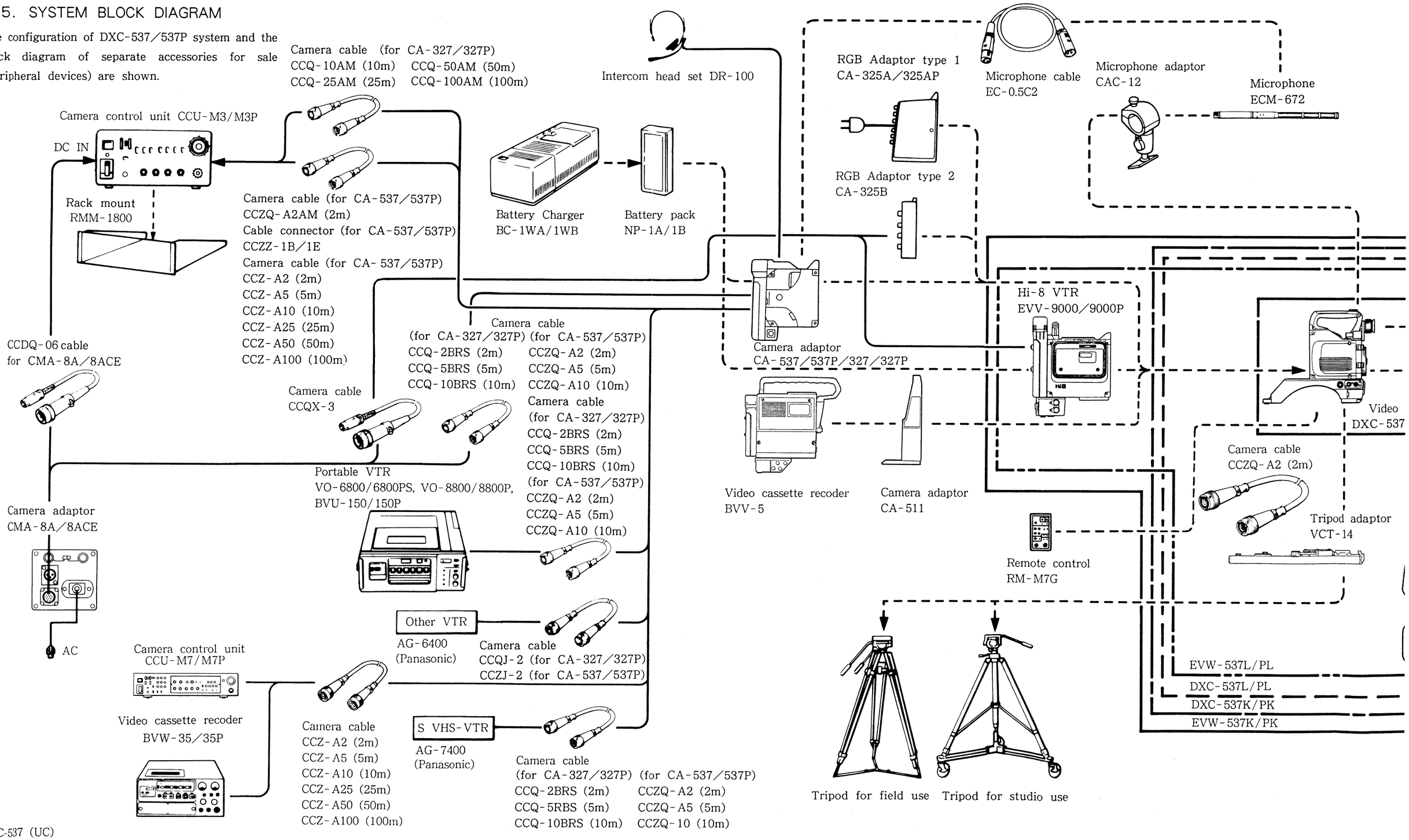
2-4-2. Connections

Connections made with the connector panels during installation or service, should be made with the connectors or complete cable assemblies specified in the following list, or equivalent parts.

Connector function	Parts No. and name of connector with cable
REMOTE (10P, FEMALE)	1-506-522-11 CONNECTOR, ROUND 10P, MALE HIROSE HR10A-10P-10P equality or CCA-7-20 Cable assembly (optional)
VIDEO OUT (BNC)	1-560-069-11 PLUG, BNC or B-B cable assembly (Cable length 1.5m, optional
VF (8P, FEMALE)	9-994-797-01 CABLE, VF
LENS	1-564-360-11 CONNECTOR, 12P, MALE HIROSE HR10-10PA-12P equality

2-5. SYSTEM BLOCK DIAGRAM

The configuration of DXC-537/537P system and the block diagram of separate accessories for sale (peripheral devices) are shown.



Intercom head set DR-100

RGB Adaptor type 1
CA-325A/325AP

Microphone cable
EC-0.5C2

Microphone adaptor
CAC-12

Microphone
ECM-672

Viewfinder
DXF-40A/40ACE/50/50CE

Flexible cable unit
LO-23

RGB Adaptor type 2
CA-325B

ger
'B

Battery pack
NP-1A/1B

Hi-8 VTR
EVV-9000/9000P

Viewfinder
DXF-501/501CE

Zoom lens
VCL-916BY

A-537/537P)
A2 (2m)
A5 (5m)
A10 (10m)
ı cable
A-327/327P)
BRS (2m)
BRS (5m)
0BRS (10m)
A-537/537P)
A2 (2m)
A5 (5m)
A10 (10m)

Camera adaptor
CA-537/537P/327/327P

Video camera
DXC-537H/PH

2/3 inch Zoom lens
12 pin type

Camera cable
CCZQ-A2 (2m)

Video cassette recoder
BVV-5

Camera adaptor
CA-511

Tripod adaptor
VCT-14

Carring case
LC-421

Micro scope adaptor
MVA-31

Remote control
RM-M7G

Endo scope adaptor
MVA-302

EVW-537L/PL
DXC-537L/PL
DXC-537K/PK
EVW-537K/PK

:A-327/327P)
A-537/537P)

cable
-327/327P) (for CA-537/537P)
RS (2m) CCZQ-A2 (2m)
BS (5m) CCZQ-A5 (5m)
3RS (10m) CCZQ-10 (10m)

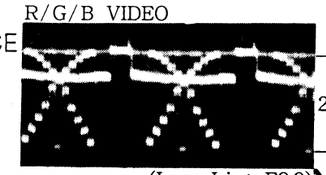
Tripod for field use

Tripod for studio use

2-6. CHECK AND MAINTENANCE

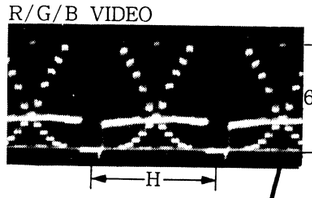
2-6-1. Video Level Check Sheet

TP2/TP8/TP14
R/G/B VIDEO

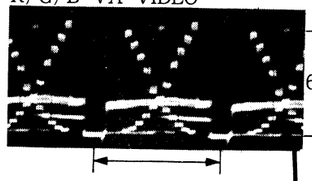


(Lens Iris ≒ F8.0)

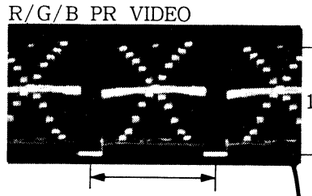
TP3/TP9/TP15
R/G/B VIDEO



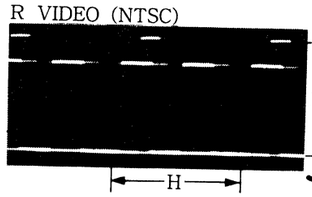
TP4/TP10/TP16
R/G/B VA VIDEO



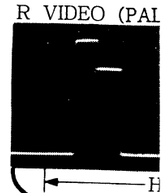
TP6/TP12/TP18
R/G/B PR VIDEO



pin A7
R VIDEO (NTSC)



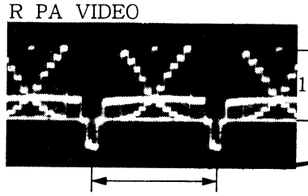
pin A7
R VIDEO (PAL



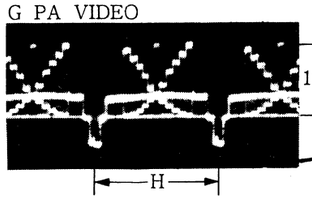
CCD BLOCK PR-143

EN-95

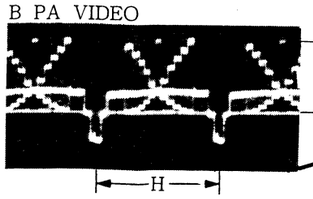
pin B19
R PA VIDEO



pin B20
G PA VIDEO



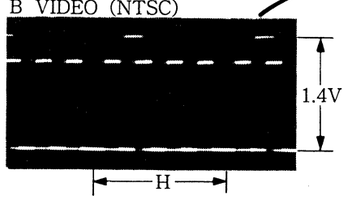
pin B21
B PA VIDEO



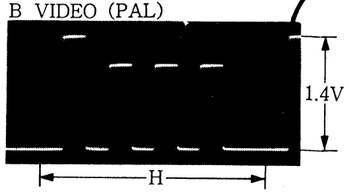
R-ch CCD IMAGER
G-ch CCD IMAGER
B-ch CCD IMAGER
GAIN UP CONT
GAIN CONT
PRE KNEE
WHITE LIMIT
H DTL
V DTL
1H DELAY
PED CONT & GAMMA CORR.
WHITE CLIP
R-Y MATRIX
CHROMA ENCODER
Y MATRIX
B-Y MATRIX
R/R-Y SEL
G/Y SEL
B/B-Y SEL

IE-28

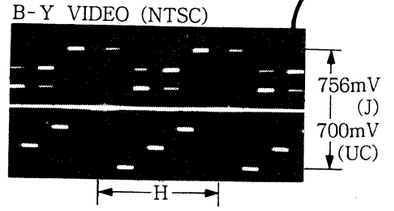
pin A5
B VIDEO (NTSC)



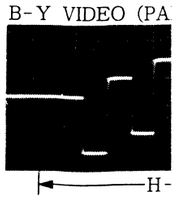
pin A5
B VIDEO (PAL)



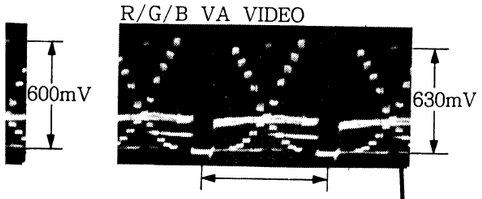
pin A5
B-Y VIDEO (NTSC)



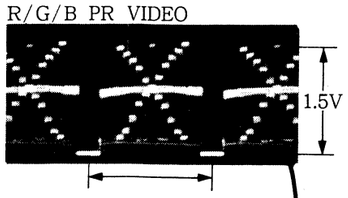
pin A5
B-Y VIDEO (PA



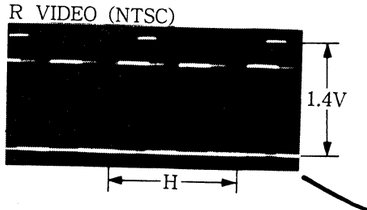
TP4/TP10/TP16
R/G/B VA VIDEO



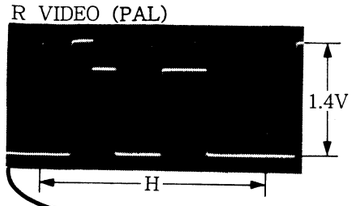
TP6/TP12/TP18
R/G/B PR VIDEO



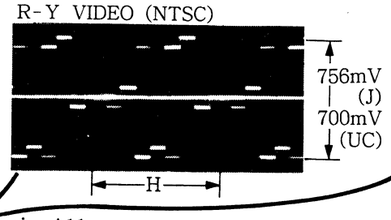
pin A7
R VIDEO (NTSC)



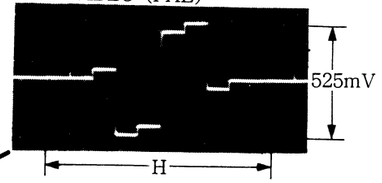
pin A7
R VIDEO (PAL)



pin A7
R-Y VIDEO (NTSC)



pin A7
R-Y VIDEO (PAL)



EN-95

TP4 TP5 TP6

RV4 R VA GAIN

PED CONT & GAMMA CORR.

RV7 R PED RV5 R ADJ RV6 R BAL

WHITE CLIP

1-A11 1-B10

H DTL

V DTL

1H DELAY

RV2 2H GAIN

RV1 1H GAIN

3-4 3-2 2-7

TP10 TP11 TP12

PED CONT & GAMMA CORR.

RV15 G PED RV13 G ADJ RV14 G BAL

WHITE CLIP

1-A10 1-B9

TP16 TP17 TP18

RV19 B VA GAIN

PED CONT & GAMMA CORR.

RV22 B PED RV20 B ADJ RV21 B BAL

WHITE CLIP

1-A9 1-B8

R-Y MATRIX

RV9 R-Y LEVEL

R/R-Y SEL

1-A7

CHROMA ENCODER

RV5 CHROMA LEVEL

RV6 CHROMA(Y/C) LEVEL

TP1

1-A11

1-A14

G/Y SEL

1-A6

Y MATRIX

RV18 Y LEVEL(COMP)

RV11 Y LEVEL

1-A9

B-Y MATRIX

RV17 B-Y LEVEL

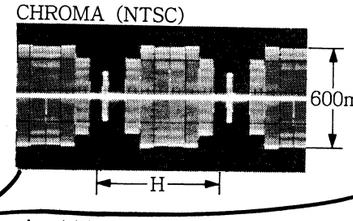
B/B-Y SEL

1-A5

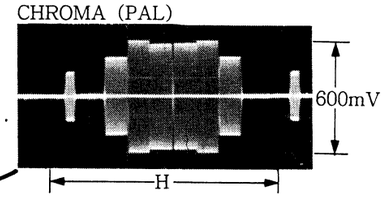
TO CA-537/ 537P

E-28

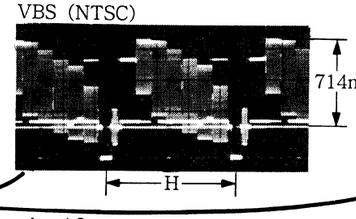
pin A11
CHROMA (NTSC)



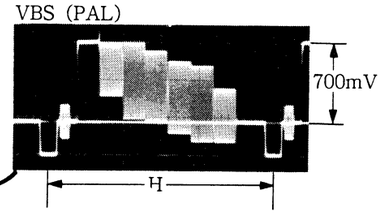
pin A11
CHROMA (PAL)



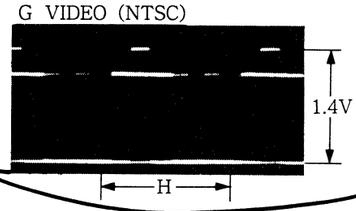
pin A14
VBS (NTSC)



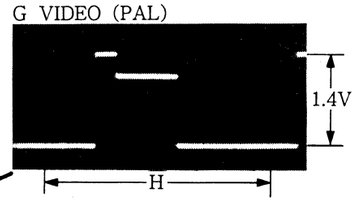
pin A14
VBS (PAL)



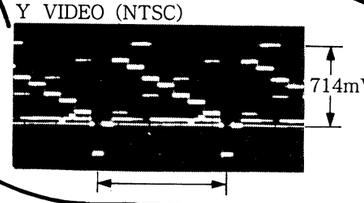
pin A6
G VIDEO (NTSC)



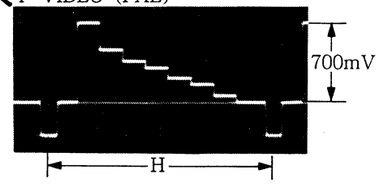
pin A6
G VIDEO (PAL)



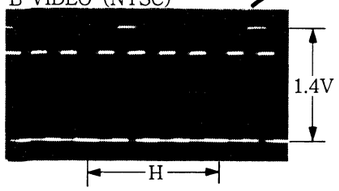
pin A6
Y VIDEO (NTSC)



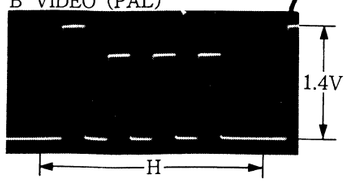
pin A6
Y VIDEO (PAL)



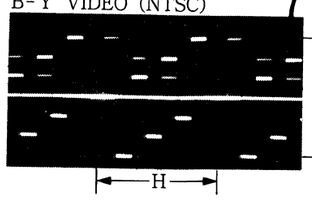
pin A5
B VIDEO (NTSC)



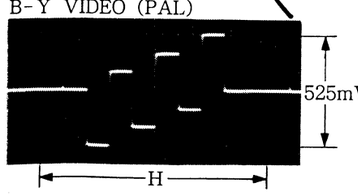
pin A5
B VIDEO (PAL)



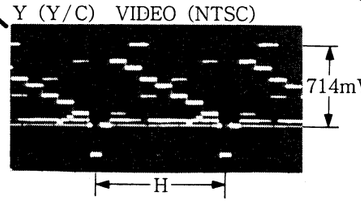
pin A5
B-Y VIDEO (NTSC)



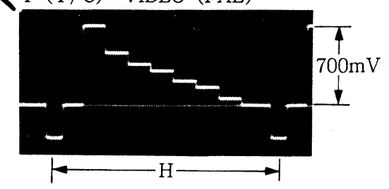
pin A5
B-Y VIDEO (PAL)



pin A9
Y (Y/C) VIDEO (NTSC)



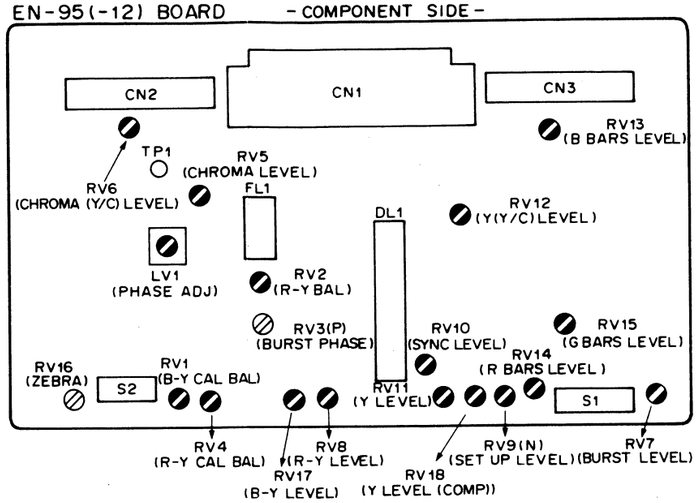
pin A9
Y (Y/C) VIDEO (PAL)



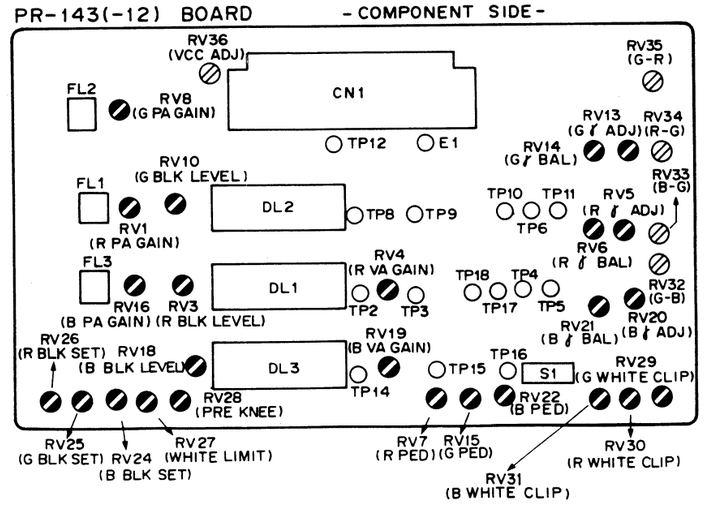
DXC-537 (UC)
DXC-537P (EK)

	Item	Setting	Measuring point	Adjustment point	Spec.	Remark
Step 1	BARS Level	GAIN Switch→0dB OUTPUT Switch→BARS	A6Pin/Extension Board(EN-95)	RV15/EN-95	1.4±0.02 Vp-p	
			Waveform Monitor	RV13/EN-95 RV14/EN-95	The carrier leakage at gray portion is minimum	
Step 2	Carrier Balance		Vector Scope	RV1/EN-95 RV4/EN-95	White beam spot→Center	Be sure to use a vector scope compatible with setup level "0".
Step 3	Burst Level			RV7/EN-95	Burst 75% Position	
Step 4	Color Vector			RV2, RV5 LV1/EN-95	Beam spots of each color →inside the ⊞ mark	
Step 5	SYNC Level		Waveform Monitor	RV10/EN-95	40±2 IRE	
Step 6	Set Up Level			RV9/EN-95	0±0.5 IRE	
Step 7	Y Level			RV11/EN-95	100±2 IRE	
Step 8	COMP Level		A6Pin/Extension Board(EN-95)	RV18/EN-95	Y Level : 714mV	
Step 9	COMP B-Y Level		A5Pin/Extension Board(EN-95)	RV17/EN-95	756±10 mVp-p	
Step 10	COMP R-Y Level		A7Pin/Extension Board(EN-95)	RV8/EN-95	756±10 mVp-p	
Step 11	Y/C Y Level		A9Pin/Extension Board(EN-95)	RV12/EN-95	Y Level : 714mV	VTR Switch/CA-537/537P→3
Step 12	Y/C Chroma Level		A11Pin/Extension Board(EN-	RV6/EN-95	Burst Level : 286mV	
Step 13	G Video Level	Object : Gray Scale Chart GAIN Switch→0dB WHITE BAL Switch →PRE SET	TP8/PR-143	RV8/PR-143	Video Level : 250±5 mV	Lens Iris F≒8.0
Step 14	B Video Level		TP14/PR-143	RV16/PR-143		
Step 15	R Video Level		TP2/PR-143	RV1/PR-143		
Step 16	DC Set	Lens Iris→Close	TP9/PR-143	RV10/PR-143	DC Level : 0±10 mVdc	
			TP3/PR-143	RV3/PR-143		
			TP15/PR-143	RV18/PR-143		
Step 17	White Limit Level	GAIN Switch→0dB Object : Gray Scale Chart	TP9/PR-143	RV27/PR-143	White Level : 1.2V	Lens Iris F≒8.0
Step 18	PRE Knee		TP9/PR-143	RV28/PR-143	White Level : 1.1V	
Step 19	Black Set & Pedestal	Lens Iris→Close GAIN Switch→0dB	TP12/PR-143	RV25/PR-143 RV15/PR-143		
		Lens Iris→Close GAIN Switch→18dB	Vector Scope	RV24/PR-143 RV26/PR-143		Be sure to use a vector scope compatible with setup level "0".
		Lens Iris→Close GAIN Switch→0dB		RV7/PR-143 RV22/PR-143		
Step 20	1H Gain Level	Records the right half of the white window chart.	CH1: TP9/PR-143 CH2: TP9/IE-28	CV2/IE-28	The phase of CH1 is aligned to CH2.	Observe the trailing edge of the white level.
Step 21	R/B Pre Set White	GAIN Switch→0dB Object : Gray Scale Chart Lens Iris F≒8.0	CH1: TP10/PR-143 CH2: TP4/PR-143	RV4/PR-143	The waveform becomes flat.	Make the gain of CH1 and CH2 equal. Put the CH1 into the GAIN ADD mode and the CH2 into the INVERT mode.
			CH1: TP10/PR-143 CH2: TP16/PR-143	RV19/PR-143	The waveform becomes flat.	
Step 22	G Gamma Balance		TP11/PR-143	RV14/PR-143	The white level of the video signal does not change when RV13/PR-143 is turned either fully counterclockwise or fully clockwise.	
Step 23	G Gamma Set		TP11/PR-143	RV13/PR-143	Crosspoint : 795mV	
Step 24	R Gamma Balance		TP5/PR-143	RV6/PR-143	The white level of the video signal does not change when RV5/PR-143 is turned either fully counterclockwise or fully clockwise.	
Step 25	B Gamma Balance		TP17/PR-143	RV21/PR-143	The white level of the video signal does not change when RV20/PR-143 is turned either fully counterclockwise or fully clockwise.	
Step 26	R/B Gamma Set		Vector Scope	RV5/PR-143 RV20/PR-143	White beam spot→Center	Be sure to use a vector scope compatible with setup level "0".
Step 27	R/B White Clip	Object : Gray Scale Chart Lens Iris→Open	Waveform Monitor	RV30/PR-143 RV31/PR-143	Carrier of white portion is minimized	
Step 28	G White Clip			RV29/PR-143	Clip : 110 IRE	

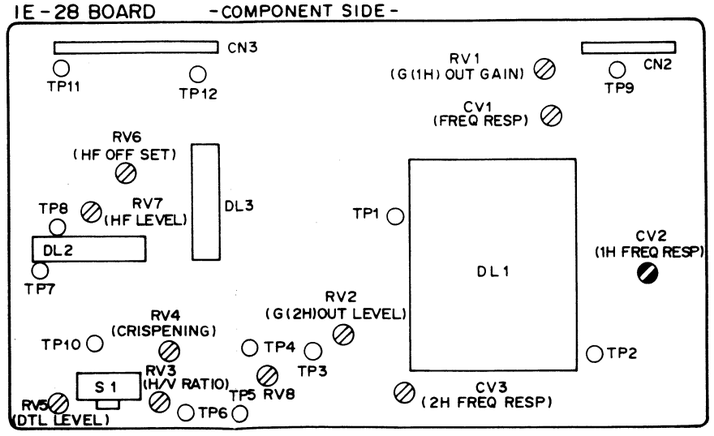
EN-95(-12) BOARD -COMPONENT SIDE-



PR-143(-12) BOARD -COMPONENT SIDE-



IE-28 BOARD -COMPONENT SIDE-



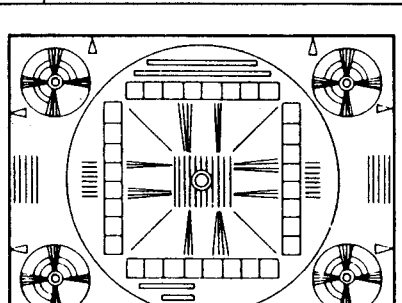
SECTION 3
ALIGNMENT

3-1. PREPARATION

3-1-1. Equipment Required

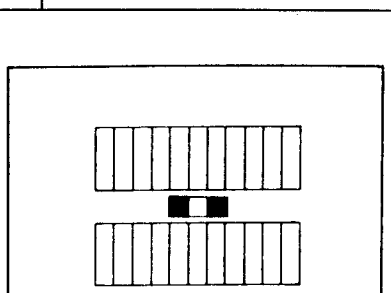
- Oscilloscope (more than 100 MHz)
- Waveform monitor
- Vectorscope
- Black and white monitor
  (Sony PVM-91CE/122CE or equivalent)
- Color Monitor (Sony PVM-1320 or equivalent)
- AC Adaptor (Sony CMA-8CE/8ACE)
- Frequency counter

J-6026-100-A	Resolution chart



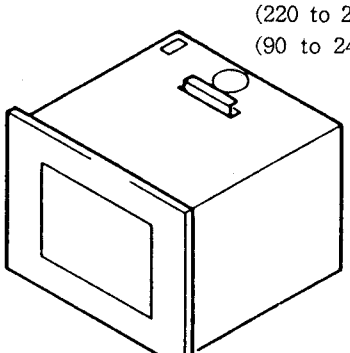
J-6026-110-A	Multiburst chart

J-6026-130-A	Grayscale chart



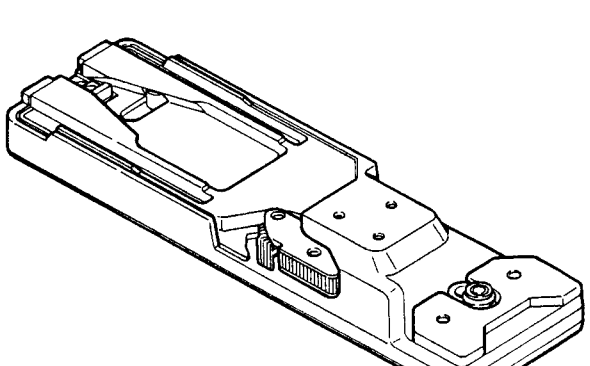
J-6029-140-A	PTB-500 Pattern Box

- Light source for test chart
  (220 to 240 VAC : PTB-220)
  (90 to 240 VAC : PTB-500)



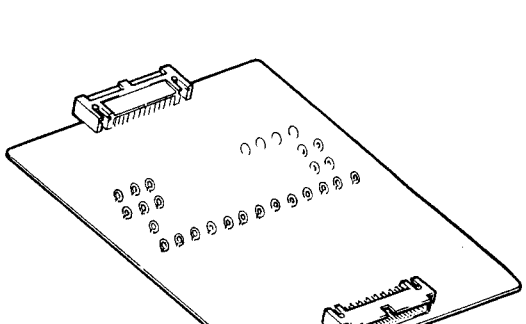
The PTB – 220 (Pattern Box) is also able to use.

VCT-12 Tripod Adaptor

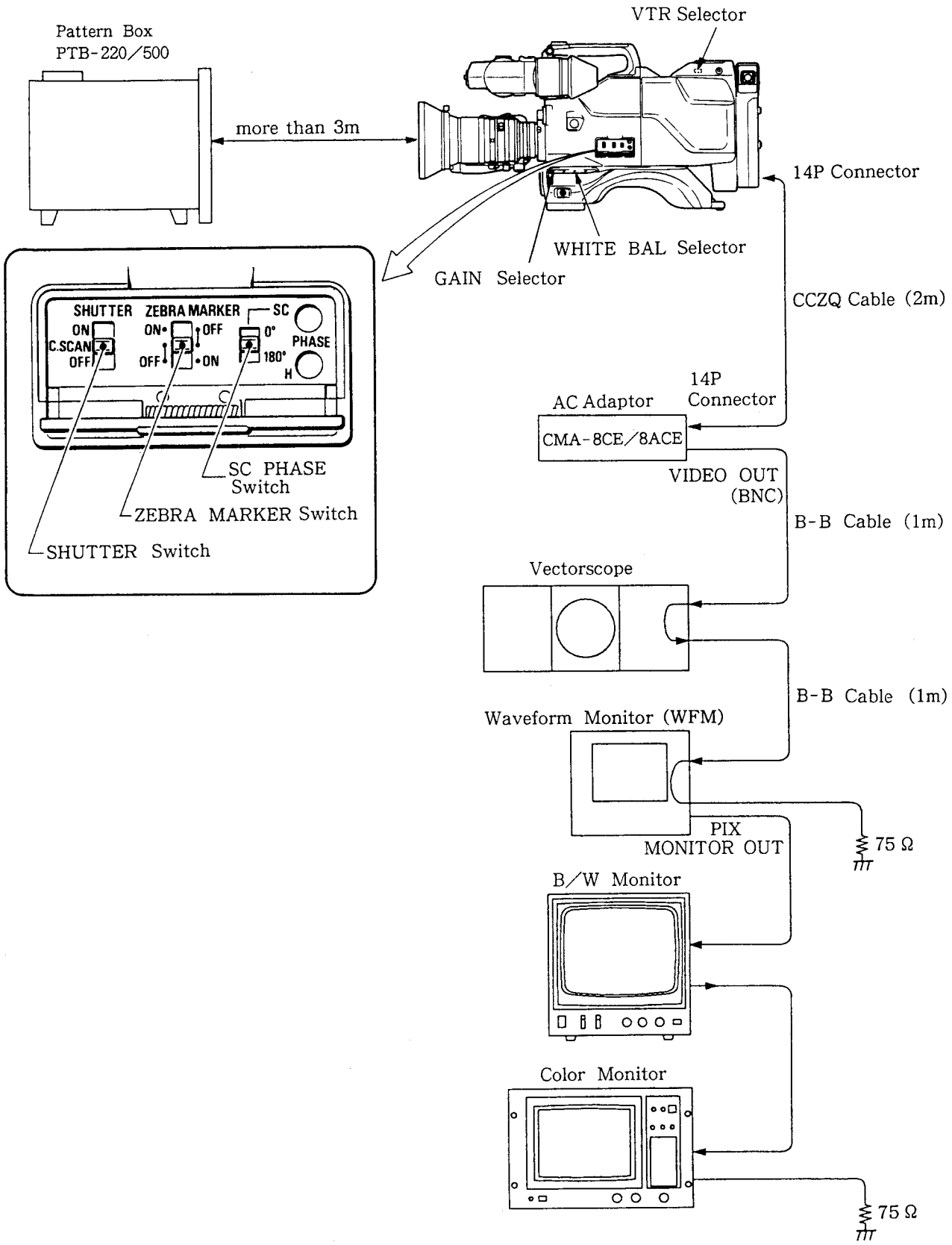


J-6309-200-A	Extension board EX – 327

- For adjustment of SG-171, PR-143, IE-28 and EN-95 boards



3-1-2. Connections and Initial Setting



3-1-3. Initial Setting

Set the camera switches and controls as follows.

GAIN switch	: 0 dB
OUTPUT switch	: CAM
WHITE BAL switch	: PRESET
FILTER knob	: 1
VTR SELECT switch (CA-537P)	: 1
IRIS (Lens)	: Manual
ZOOM (Lens)	: Manual
S1 (MASKING) / PR-143 board	: OFF
S1 (DTL) / IE-28 board	: OFF
S1 (SHUTTER) / AT-59 board	: OFF
S2 (ADJ/OPE) / AT-59 board	: ADJ
S5 (ZEBRA/MARKER) / AT-59 board	: OFF

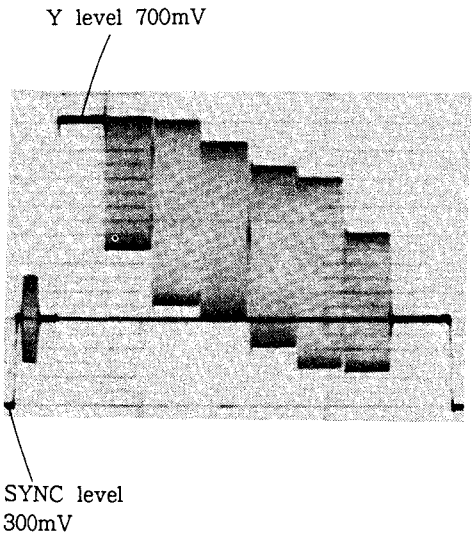
Note : During the adjustment, do not touch the following switch.
- S2 (ADJ/OPE) / AT-59 board

3-2. BEFORE ADJUSTMENT

Note : 1. Before adjustment, connect the equipments referring to Item 3-1-2. Connections.
2. Before adjustment, set the POWER switch to ON and allow for 10 minute warm-up time.

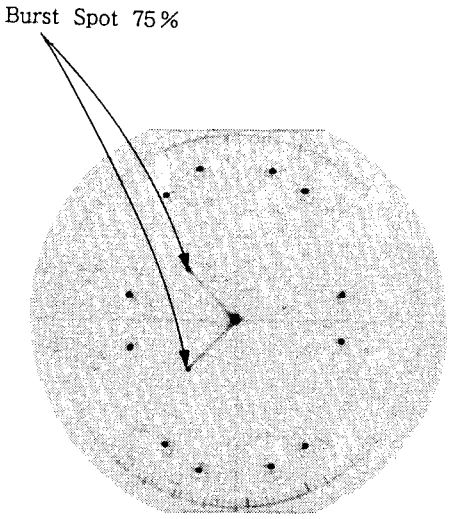
3-2-1. Color Bar Signal

Equipment : Vectorscope, Waveform monitor
Preparation : Set the OUTPUT switch on the side of the camera to BARS.
Specifications :



Chroma level

- Confirm that the beam spots of each color (R, YL, G, CY, G, CY, B, and MG) are inside the "⊞" mark.



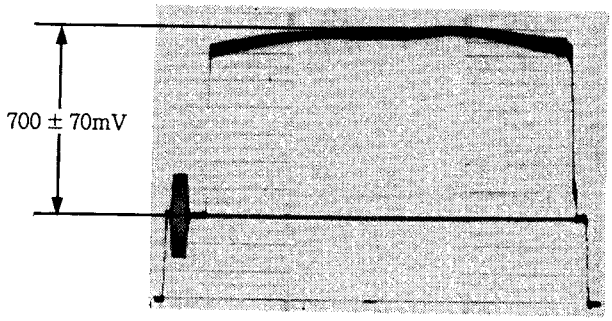
Note : Partial difference between scale and signal level is caused by photographic error.
: If the specifications are not met, carry out Item 3-4. ENCODER SYSTEM (EN-95 board) adjustment.

3-2-2. Sensitivity Measurement

Object : White pattern
Light : 3200K、2000 lux
(If the pattern box "PTB－220／500" is used, set the AUTO mode)
Preparation :

- Adjust the zoom control at "TELE" so that the white pattern frame matches the underscanned picture frame on the screen.
- Manually set the iris control to F8.
- Set the OUTPUT switch on the side of the camera to CAM.
- Set the WHITE BAL switch on the side of the camera to PRESET.

Equipment : Waveform monitor
Specifications : 700 ± 70mV



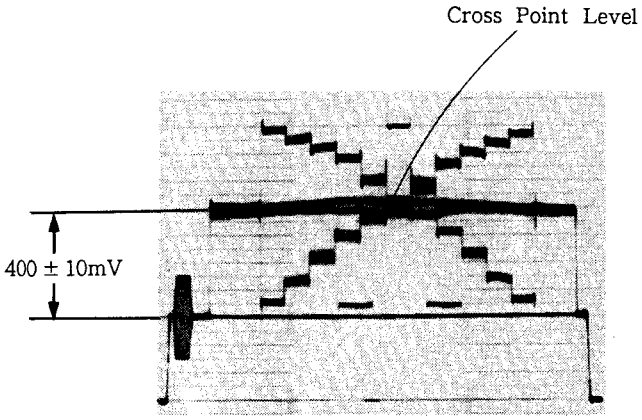
Note : If the specification is not met, perform all adjustments in Item 3-5. VIDEO PROCESS SYSTEM.

3-2-3. Gamma and Gradation Measurement

Object : Grayscale chart
(Sony parts number J-6026-130-A)
Light : Pattern box PTB-220/500
Equipment : Waveform monitor
Preparation :

- Set the OUTPUT switch on the side of the camera to CAM.
- Set the WHITE BAL switch on the side of the camera to PRESET.
- Adjust the zoom control so that the Grayscale chart frame matches the underscanned picture frame on the screen.
- Adjust the iris control so that the white level of Grayscale chart is 700mV on the waveform monitor.

Specifications : Confirm that the cross point level of the Grayscale chart is 400 ± 10mV.



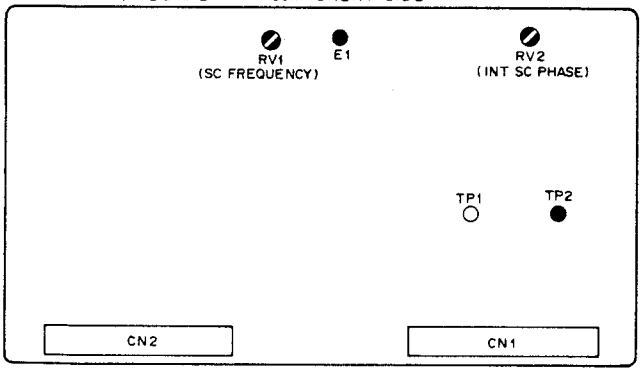
Note : Partial difference between signal level and scale is caused by a photographic error.
: If the specification is not met, carry out Item 3-5-15. through Item 3-5-19..

3-3. SYNC SIGNAL SYSTEM (SG-171 BOARD)

3-3-1. Sub Carrier Frequency Adjustment

Equipment : Frequency counter
To be extended : EN-95 board
Test point : TP2 (GND : E1) / SG-171 board
Adjustment point : ⊘RV1/SG-171 board
Specification : 4,433618 ± 10Hz

SG-171(-11) BOARD -COMPONENT SIDE-



3-3-2. INT SC Phase Adjustment

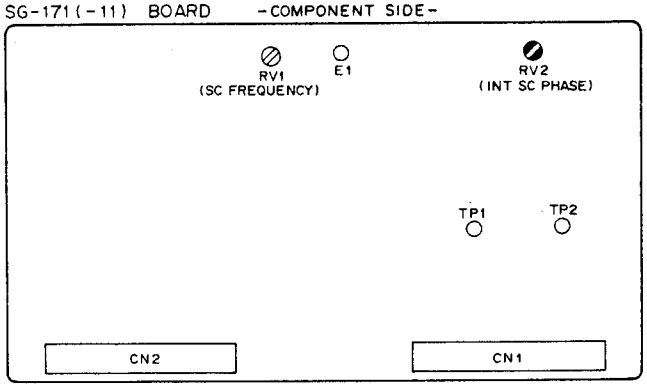
Note : Stated below is a procedure with the SC-H phase measuring equipment (Tektronicx 1751). If any other equipment is used, perform adjustment at the following adjustment point by reading the instruction manual attached.

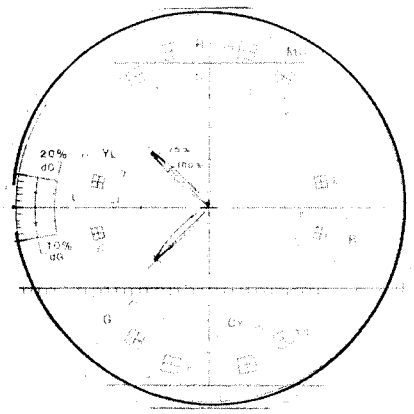
Equipment : SC-H phase measuring equipment
To be extended : SG-171 board
Preparation :
- Disconnect the vectorscope and connect the Tektronix 1751 instead.
- Put the Tektronix 1751 to SC-H mode.

Test point : VIDEO OUT connector (side panel)
Adjustment point : ◐RV2 (INT SC PHASE) /SG-171 board
Specification : See below.

Adjustment Procedures
1. Adjust the phase relationship between SC (burst) and H beam spot correctly with ◐RV2 (INT SC PHASE).

SG-171(-11) BOARD -COMPONENT SIDE-



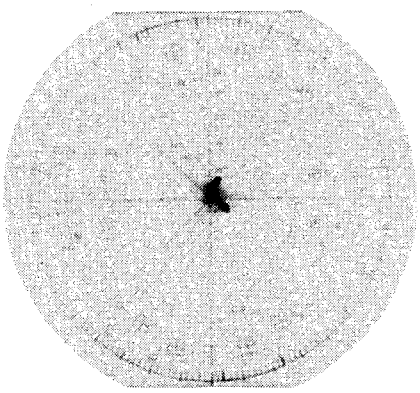


Note : After the adjustment, disconnect Tektronix 1751 and connect the vectorscope.

3-4. ENCODER SYSTEM (EN-95 BOARD)

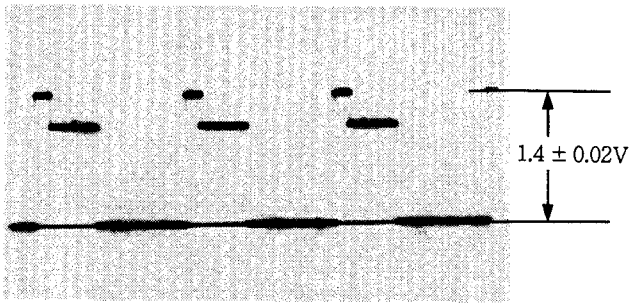
3-4-1. Carrier Balance Adjustment

Equipment : Vectorscope (MAX GAIN)
To be extended : EN-95 board
Preparation :
• Set the OUTPUT switch on the side of the camera to BARS.
Adjustment : Adjust ⊘RV1 and ⊘RV4/EN-95 board so that the white beam spot is in the center of the vectorscope.

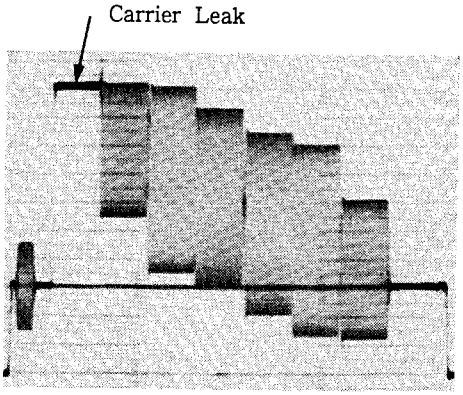


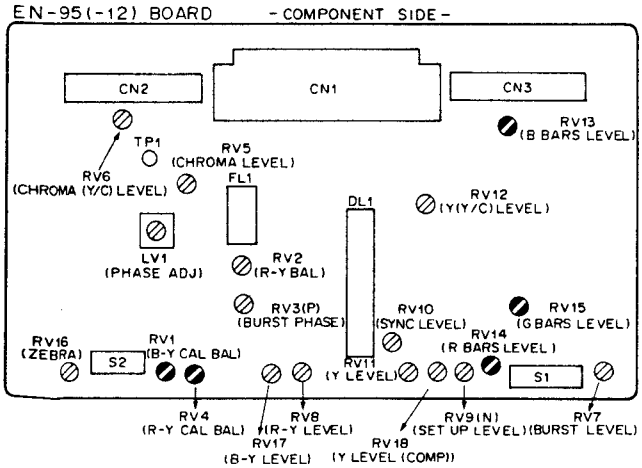
3-4-2. BARS Level Adjustment

Equipment : Oscilloscope, Waveform monitor
To be extended : EN-95 board
Preparation :
• OUTPUT switch (camera side panel) → BARS
• S1/IF-313 board → RGB (upper side)
Trigger : HD (pin B18/extension board)
Adjustment :
1. Adjust ⊘RV15/EN-95 board so that the video level at pin A6 (GND : pin A8)/extension board is 1.4 ± 0.02V.



2. Adjust ⊘RV13, ⊘RV14/EN-95 board so that the carrier leakage at white portion is minimum.





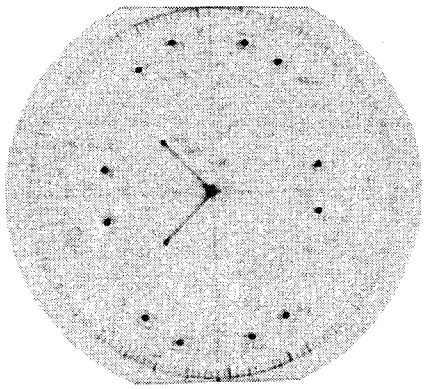
3-4-3. Color Vector Adjustment

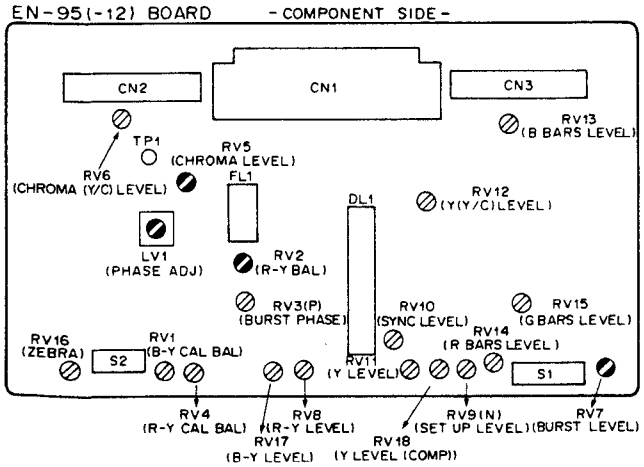
Equipment : Vectorscope
To be extended : EN-95 board
Preparation :

- Set the GAIN switch on the vectorscope to 75%.
- Adjust "PHASE" control on the Vectorscope so that the burst spot is set to the 75% axis. Set the OUTPUT switch on the side of the camera to BARS.

Adjustment :

1. Adjust ⊘RV2, ⊘RV5 and ⊘LV1/EN-95 board so that the beam spots of each color are inside the "⊞" mark.
2. Adjust ⊘RV7/EN-95 board so that the burst level is set to the 75% position.



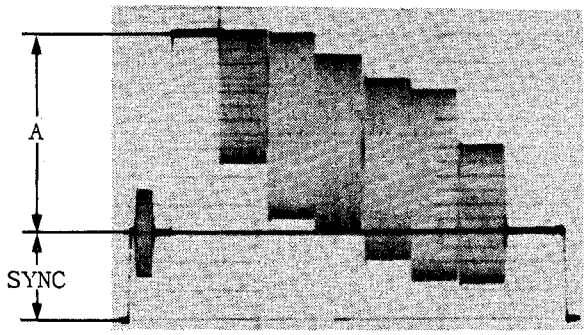


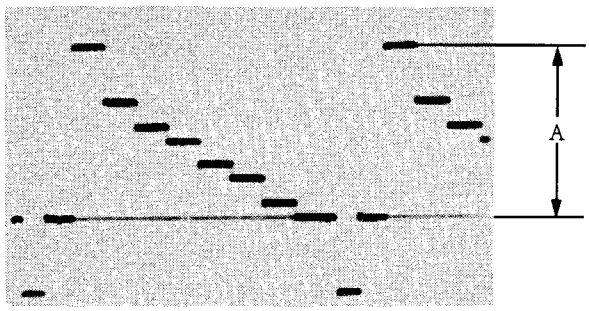
3-4-4. Y, SYNC Level Adjustment

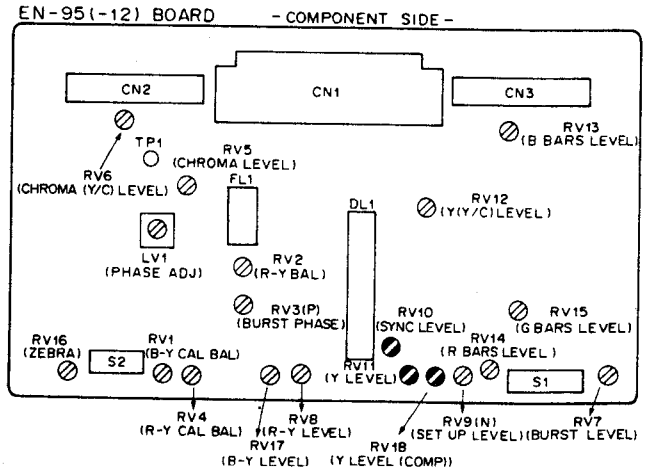
Equipment : Waveform monitor
To be extended : EN-95 board
Preparation :
• Set the OUTPUT switch on the side of camera to BARS.
Adjustment :
1. Adjust ⊘RV11/EN-95 board so that the A level of the color bars signal is 700 ± 10mV.
2. Adjust ⊘RV10/EN-95 board so that the SYNC level of the color bars signal is 300 ± 5mV.

3-4-5. COMPONENT Y Level Adjustment

Equipment : Oscilloscope
Preparation :
• OUTPUT switch (camera side panel) → BARS
• S1/IF-313 board → center position
To be extended : EN-95 board
Adjustment point : ⊘RV18/EN-95 board
Test point : pin A6 (GND : pin A8) / EN-95 board
Trigger : HD (pin B18/extension board)
Specification : A = 700 ± 10mV

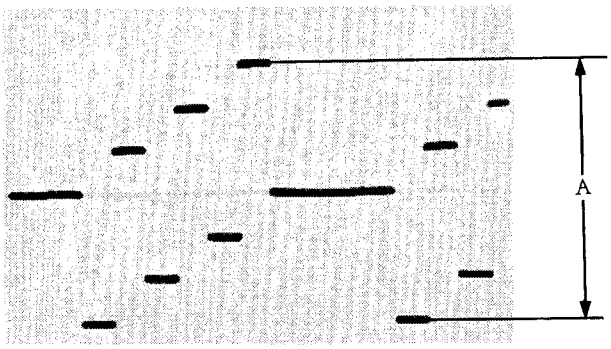






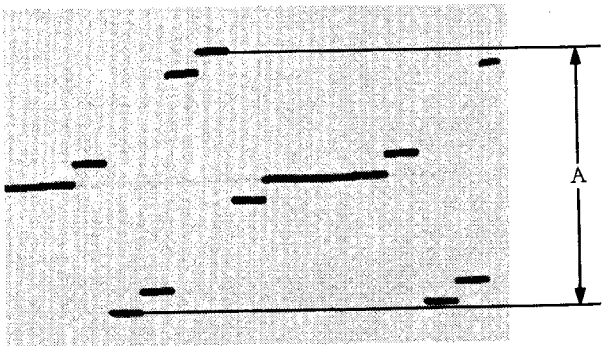
3-4-6. B-Y OUT Level Adjustment

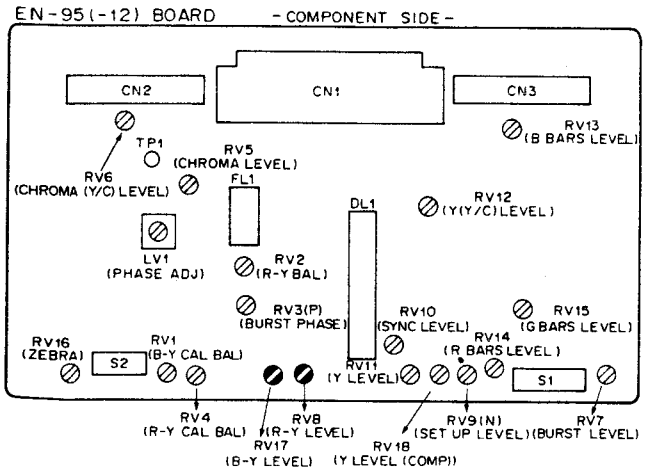
Equipment : Oscilloscope
To be extended : EN-95 board
Preparation :
• OUTPUT switch (camera side panel) →BARS
Test point : pin A5 (GND : pin A8) / extension board
Trigger : HD (pin B18/extension board)
Adjustment point : ◐RV17/EN-95 board
Specifications : A = 525 ± 10mV



3-4-7. R-Y OUT Level Adjustment

Equipment : Oscilloscope
To be extended : EN-95 board
Preparation :
• OUTPUT switch (camera side panel) →BARS
Test point : pin A7 (GND : pin A8) / extension board
Trigger : HD (pin B18/extension board)
Adjustment point : ◐RV8/EN-95 board
Specifications : A = 525 ± 10mV

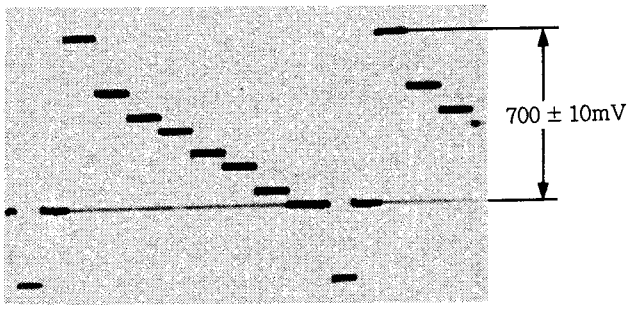




3-4-8. S-VHS VTR-Y Level Adjustment

Note : Before this adjustment, carry out Item 3-4-4. Color Vector Adjustment.

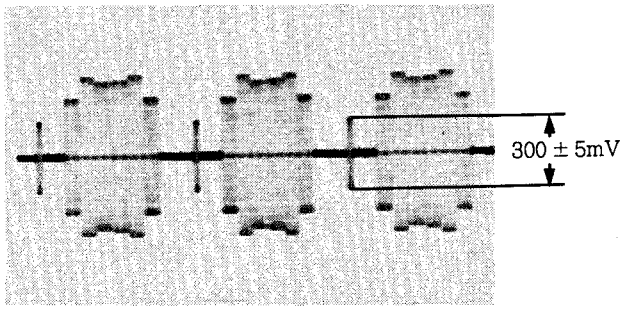
Equipment : Oscilloscope
To be extended : EN-95 board
Preparation :
• Set the OUTPUT switch on the side of camera to BARS.
Test point : pin A9(GND:pin A10)/extension board
Adjustment :
Adjust ◐RV12/EN-95 board so that the white level of Y signal is 700 ± 10mV.

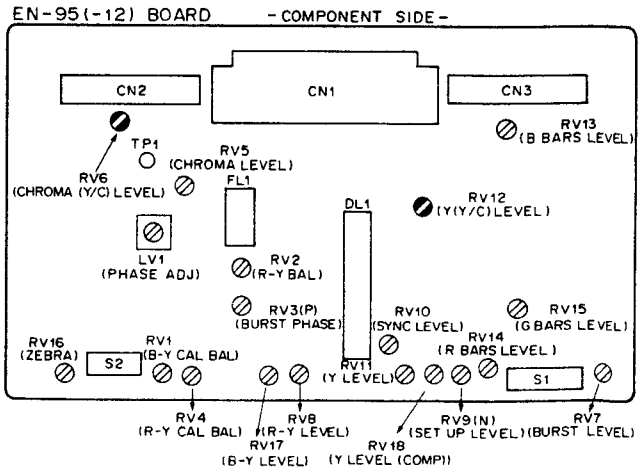


3-4-9. S-VHS VTR-Chroma Level Adjustment

Note : Before this adjustment, carry out Item 3-4-4. Color Vector Adjustment.

Equipment : Oscilloscope
To be extended : EN-95 board
Preparation :
• Set the OUTPUT switch on the side of the camera to BARS.
Test point : Pin A11 (GND : pin A12) / extension board
Adjustment :
Adjust ◐RV6/EN-95 board so that the burst level in the chroma signal is 300 ± 5mV.





3-4-10. Zebra Adjustment

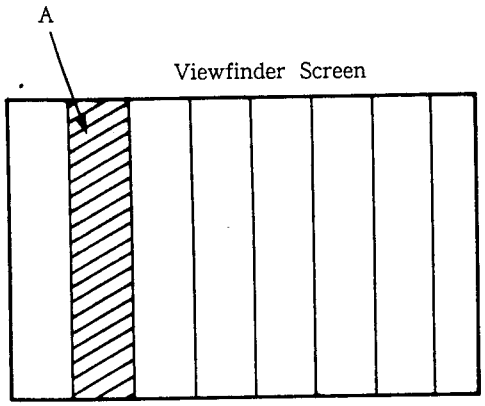
Equipment : Viewfinder
To be extended : EN-95 board
Preparation :

- Set the OUTPUT switch on the side of the camera to BARS.
- Set the S5 (ZEBRA ON/OFF) switch on the AT-59 board to ON.

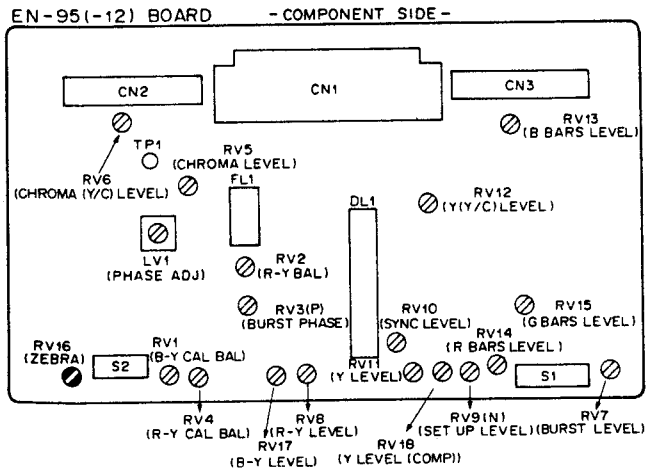
Adjustment :

Adjust ●RV16/EN-95 board so that the zebra pattern appears on the portion A of the viewfinder screen.

Zebra Pattern



Note : After adjustment, set the S5/AT-59 board to OFF.

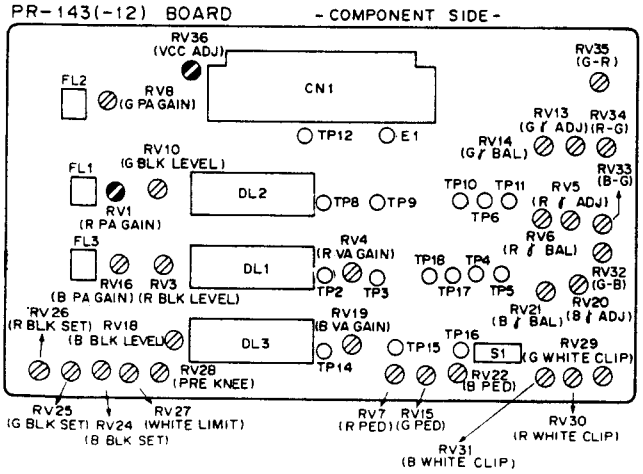


3-5. VIDEO PROCESS SYSTEM (PR-143 BOARD)

3-5-1. +8.5V Adjustment

Note : This adjustment influences operation of PR-143, IE-28 board.
Therefore , when this adjustment is carried out, all of following adjustments in VIDEO PROCESS SYSTEM and DETAIL SIGNAL SYSTEM must be confirmed. Perform adjustment when measured voltage is more than ± 1 % with respect to the specified voltage.

Equipment : Digital voltmeter
To be extended : PR-143 board
Test point : Q34-collector (E-5) / PR-143 board (GND : pin A1/extension board)
Adjustment point : ◐RV36/PR-143 board
Specification : +8.5 ± 0.1 Vdc

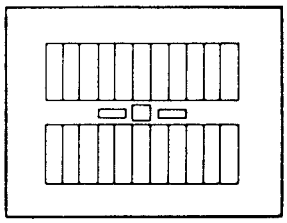


3-5-2. G ch Video Level Adjustment

Note : After this adjustment,perform the item 3-5-3. and the item 3-5-4. adjustment.

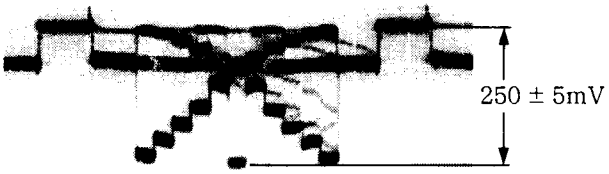
Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Preparation :
• WHITE BAL switch (camera side panel) → PRESET
• OUTPUT switch (camera side panel) → CAM
Trigger : pin A5/extension board
Adjustment :

1. Adjust the zoom control so that the chart frame matches the underscanned picture frame on the screen.

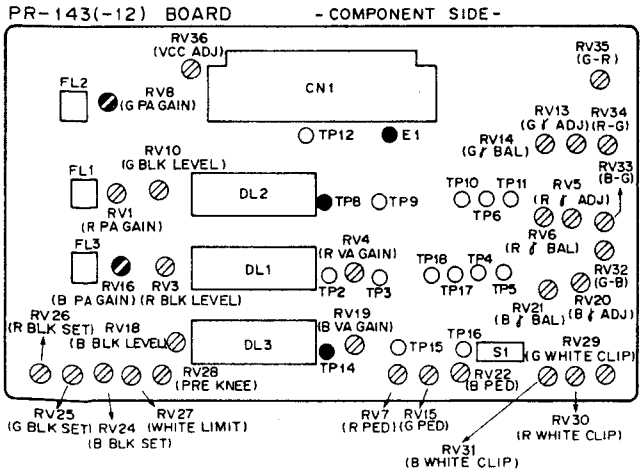


Monitor Screen

2. ◐RV8/PR-143 board → fully clockwise ↻
3. Adjust the lens iris so that the video level at TP8/PR-143 board is 250 ± 5mV.



Note : Do not adjust the iris control until the item 3-5-3. and the item 3-5-4. are completed.

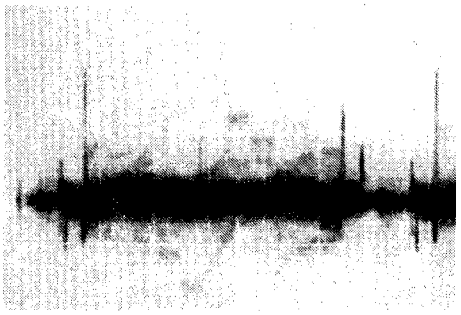


3-5-3. B ch Video Level Adjustment

Note : Be sure carry out Item 3-5-2. G ch Video Level Adjustment before this adjustment.

Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Preparation :
• WHITE BAL switch (camera side panel) → PRESET
• OUTPUT switch (camera side panel) → CAM
Trigger : pin A5/extension board
Adjustment :

1. Adjust the zoom control so that the chart frame matches the underscanned picture frame on the screen.
2. Connect CH-1 of oscilloscope to TP8 (GND : E1) /PR-143 board, and make sure that the video level is 250 ± 5mV.
3. Connect CH-2 of oscilloscope to TP14 (GND : E1) /PR-143 board, and adjust ◐RV16/PR-143 board so that the video level is about 250mV.
4. set the oscilloscope to ADD mode and CH-2 INVERT mode.
5. Readjust ◐RV16/PR-143 board so that the waveform becomes flat.



Note : Do not adjust the iris control until the item 3-5-4. are completed.

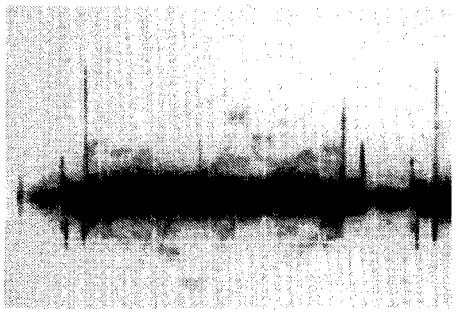
3-5-4. R ch Video Level Adjustment

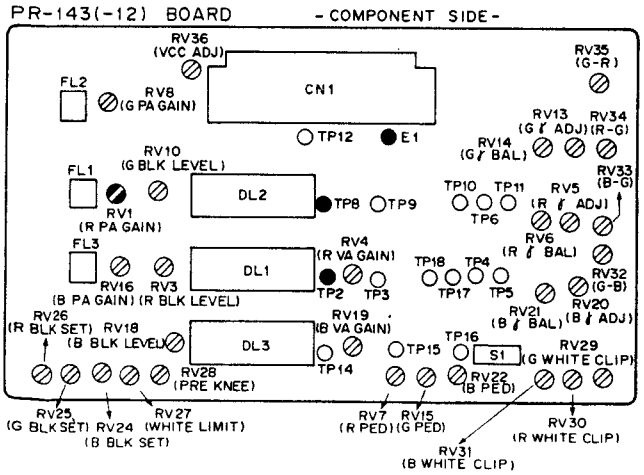
Note : Be sure to carry out Item 3-5-2. G ch Level Adjustment before this adjustment.

Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Preparation :
- Set the OUTPUT switch on the side of the camera to CAM.
- Set the WHITE BAL switch on the side of the camera to PRESET.

Trigger : Pin A5 /extension board
Adjustment :

1. Adjust the zoom control so that the chart frame matches the underscanned picture frame on the screen.
2. Connect CH-1 of oscilloscope to TP8 (GND : E1) /PR-143 board, and make sure that the video level is 250 ± 5mV.
3. Connect CH-2 of oscilloscope to TP2 (GND : E1) /PR-143 board, and adjust ⊘RV1/PR-143 board so that the video level is about 250mV.
4. Set the oscilloscope to ADD mode and CH-2 INVERT mode.
5. Readjust ⊘RV1/PR-143 board so that the waveform becomes flat.



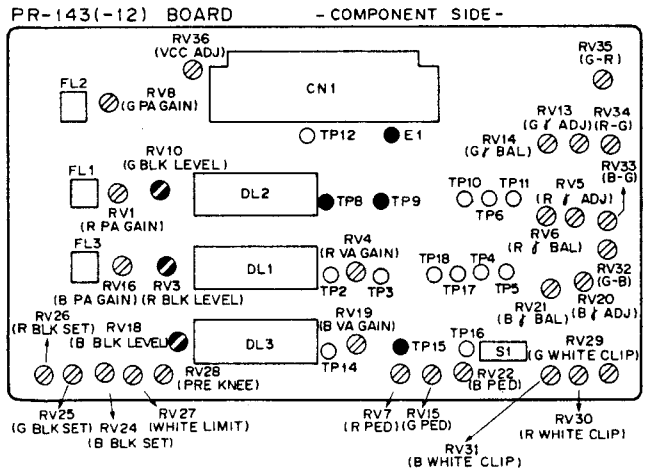


3-5-5. DC Set Adjustment

Lens iris : Close "C"
Equipment : Oscilloscope
Preparation : S2/AT-59 board → ADJ
To be extended : PR-143 board
Adjustment :

PR-143 board (GND : E1)

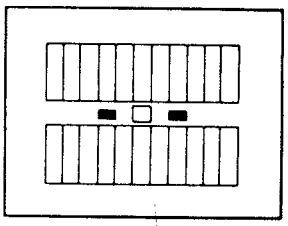
	Test Point	Adjusting point	Specification
G-ch	TP9	⊘ RV10	A = 0 ± 10mVdc
R-ch	TP8	⊘ RV3	
B-ch	TP15	⊘ RV18	



3-5-6. WHITE LIMIT Adjustment

Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Preparation :
• ⊘RV28/PR-143 board → fully clockwise ↻
• GAIN switch (camera side panel) → 0 dB
Trigger : pin A5/extension board
Adjustment :

1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.

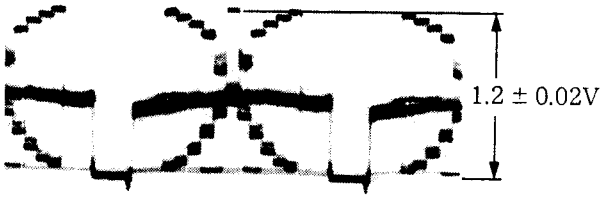


Monitor Screen

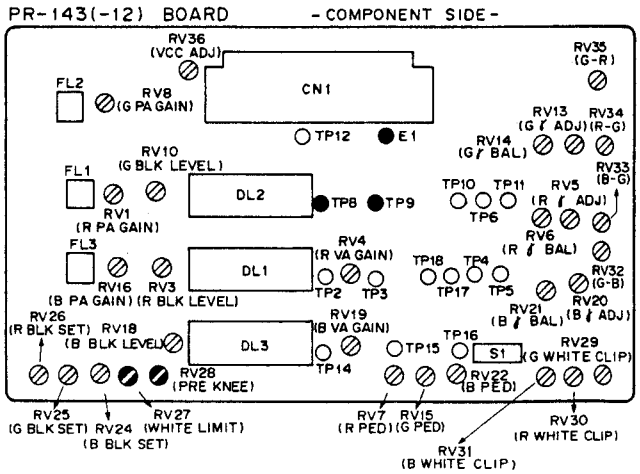
2. Adjust the iris control so that the video level at TP8 (GND : E1) /PR-143 board is 250 ± 5mV.

3. GAIN switch (camera side panel) → 9 dB

4. Adjust ⊘RV27/PR-143 board so that the white level at TP9 (GND : E1) /PR-143 board is 1.2 ± 0.02V.



Note : After adjustment, carry out Item 3-5-7. PRE KNEE Adjustment.

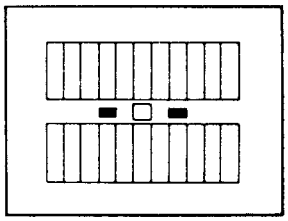


3-5-7. PRE KNEE Adjustment

Note : Be sure to complete Item 3-5-6. WHITE LIMIT Adjustment.

Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Preparation :
• ⊘RV28/PR-143 board → fully clockwise ↻
• GAIN switch (camera side panel) → 0 dB
Trigger : pin A5/extension board
Adjustment :

1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.

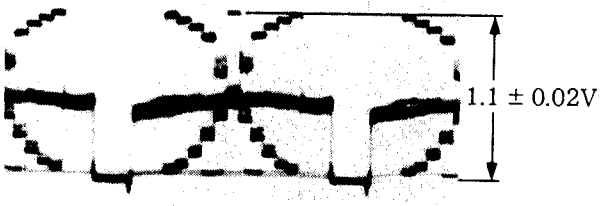


Monitor Screen

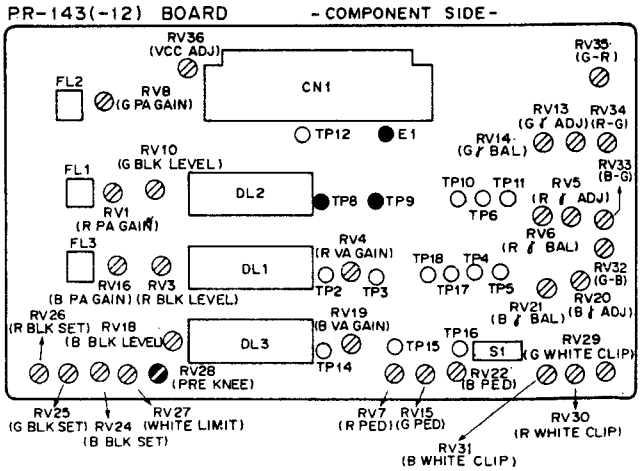
2. Adjust the iris control so that the video level at TP8 (GND : E1) / PR-143 board is 250 ± 5 mV.

3. GAIN switch (camera side panel) → 9 dB

4. Adjust ⊘RV28/PR-143 board so that the white level at TP9 (GND : E1) / PR-143 board is 1.1 ± 0.02V.



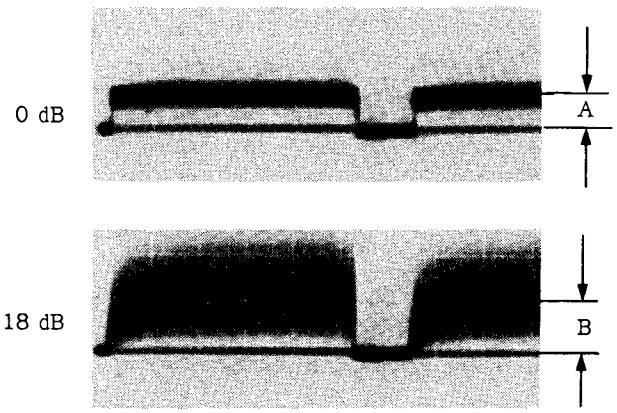
Note : After ajustment, GAIN switch/camera side panel of 0dB.



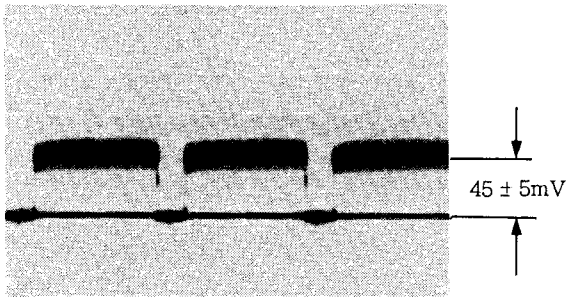
3-5-8. Black Set and Pedestal Adjustments

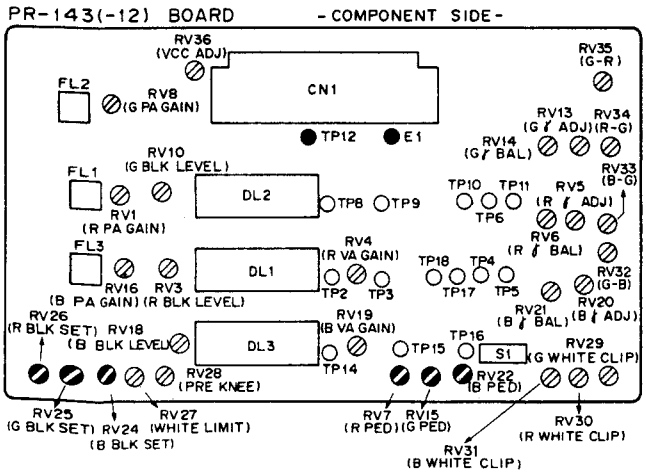
Lens iris : Close "C"
Equipment : Oscilloscope, Vectorscope (MAX GAIN)
Preparation :
• Set the S2 switch on the AT-59 board to ADJ.
To be extended : PR-143 board
Test point : TP12 (GND : E1) /PR-143 board
Adjustment :

1. Adjust ⊘RV25/PR-143 board so that pedestal level does not change when the GAIN switch on the side of the camera is switched over from 0 dB to 18 dB.

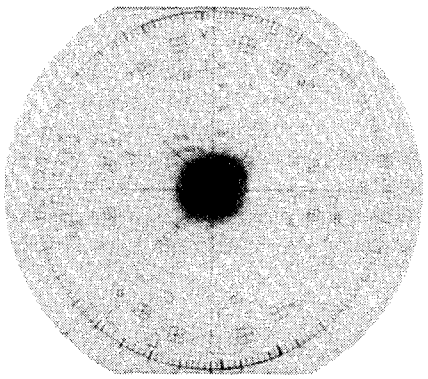


2. Set the GAIN switch on the side of the camera to 0 dB.
3. Adjust ⊘RV15/PR-143 board so that the pedestal level is 45 ± 5mV.

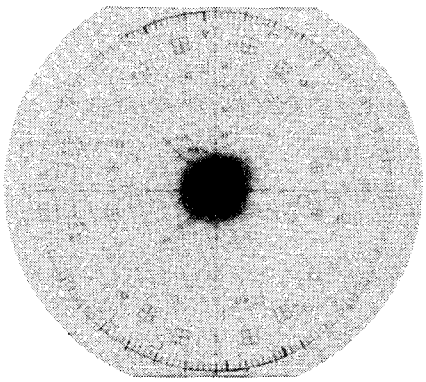




4. Set the GAIN switch on the side of the camera to 18 dB.
5. Adjust ⊘RV24 and ⊘RV26 on the PR-143 board so that the beam spot is in the center of the vectorscope.



6. Set the GAIN switch on the side of the camera to 0 dB.
7. Adjust ⊘RV7 and ⊘RV22/PR-143 board so that the beam spot is in the center of the vectorscope.



8. Repeat procedure 4 through procedure 7 several times.
9. Set the GAIN switch on the side of the camera to 0 dB.

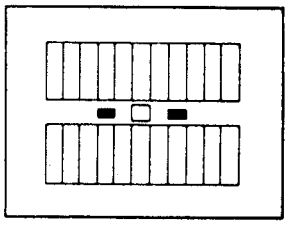
3-5-9. 1H GAIN Adjustment

Object : Grayscale chart
Equipment : Oscilloscope, Waveform monitor
To be extended : PR-143 board
Preparation :

- Set the OUTPUT switch on the side of the camera to BARS.
- Set the WHITE BAL switch on the side of the camera to PRESET.

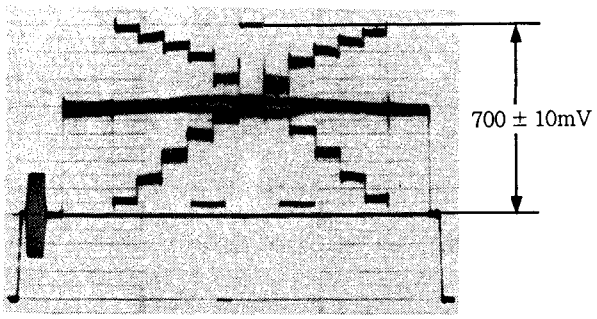
Test point : CH1 : TP9 (GND : E1) /PR-143 board
CH2 : TP9/IE-28 board
Trigger : pin A5/extension board
Adjustment point : ⊘RV1/IE-28 board
Adjustment :

1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.

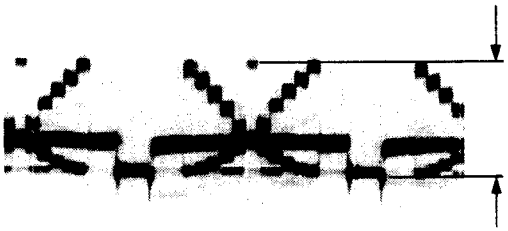


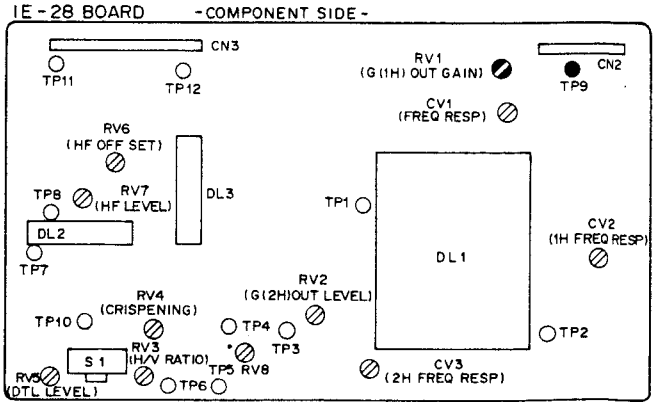
Monitor Screen

2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 10mV.



3. Set the oscilloscope to ADD mode and CH-2 INVERT mode.
4. Connect CH-1 and CH-2 of oscilloscope to TP9 (GND : E1) /PR-143 board .
   Adjust CH2-VAR control on the oscilloscope so that the waveform becomes flat for gain correction.
5. Connect CH-1 of oscilloscope to TP9 (GND : E1) /PR-143 board and CH-2 to TP9/IE-28 board (GND : pin A1/ extension board).
6. Adjust ⊘RV1 / IE-28 board so that the waveform becomes flat.

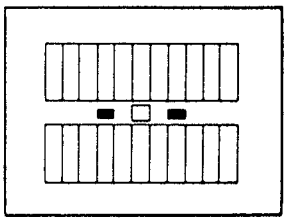




3-5-10. 2H GAIN Adjustment

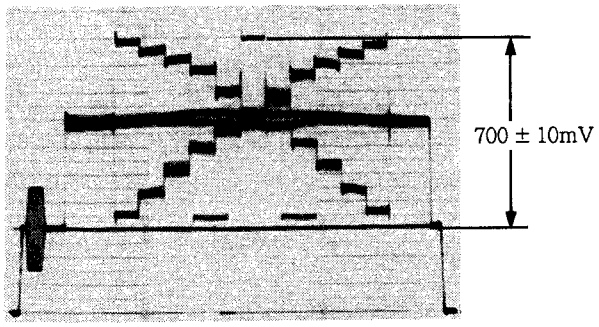
Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Test point : CH1 : TP9 (GND : E1) / PR-143 board
CH2 : TP3/IE-28 board (GND : pin A1/ extension board)
Trigger : pin A5/extension board
Adjustment point : ◐ RV2/IE-28 board
Adjustment :

1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.

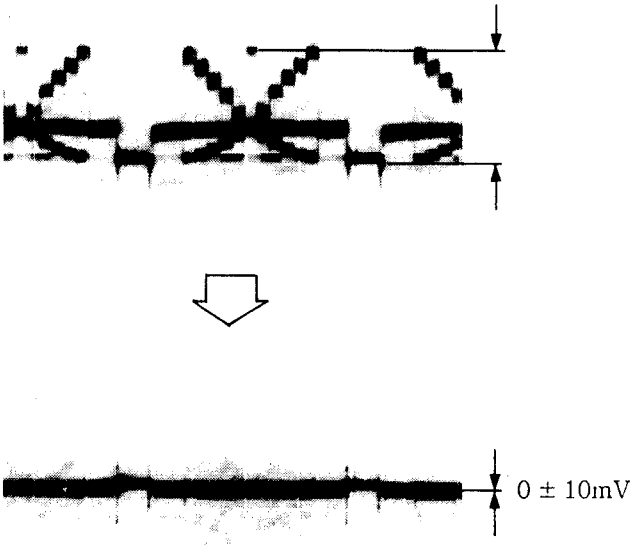


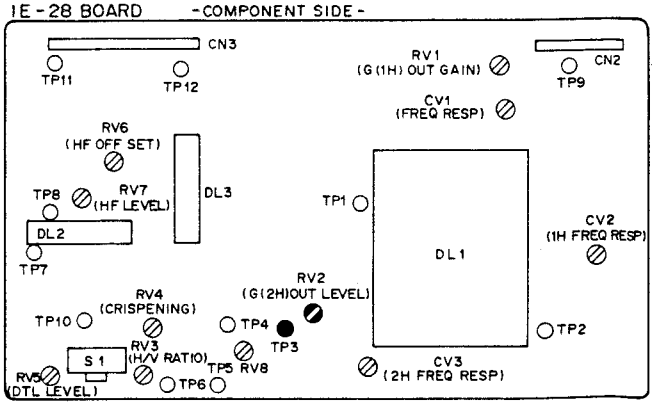
Monitor Screen

2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 10mV.



3. Set the oscilloscope to ADD mode and CH-2 INVERT mode.
4. Connect CH-1 and CH-2 of oscilloscope to TP9 (GND : E1) / PR-143 board .
   Adjust CH2-VAR control on the oscilloscope so that the waveform becomes flat for gain correction.
5. Connect CH − 1 of oscilloscope to TP9 (GND : E1) /PR − 143 board and CH − 2 to TP3/IE − 28 board (GND : pin A1/extension board).
6. Adjust ◐RV2/IE-28 board so that the waveform becomes flat.



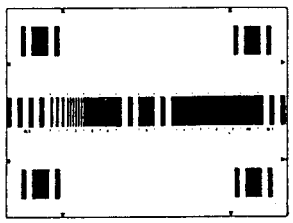


3-5-11. 1H OUT Frequency Response Adjustment

Note : Perform this adjustment only when replacing a DL1 delay line on the IE-28 board.

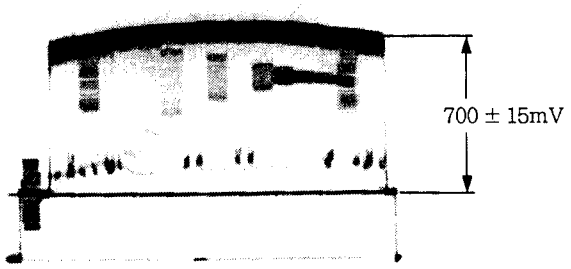
Object : Burst chart
Equipment : Oscilloscope, Waveform monitor
To be extended : PR-143 board
Adjustment :

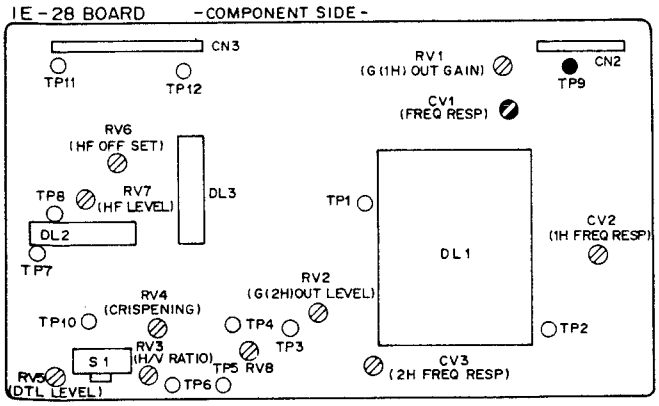
1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.



Monitor Screen

2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 15mV.



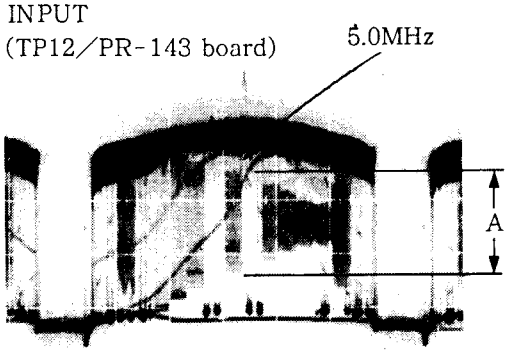


3. Adjust ⊘CV1/IE-28 board so that the input level and output level at 5.0MHz portion are almost equal as shown below.

IE-28 board (GND : E1/PR-143 board)

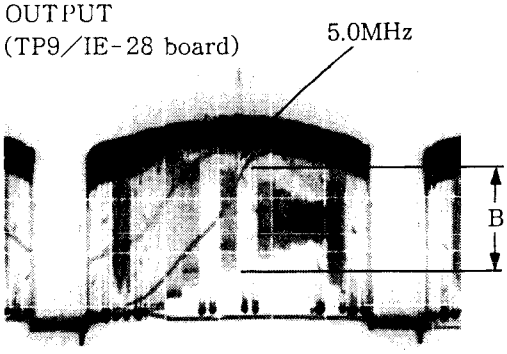
Test point (Input signal)	Test point (Ouput signal)	Adjusting point	Specification (5.0MHz)
TP12/ PR-143 board	TP9/ IE-28 board	⊘CV1	A ≒ B

INPUT
(TP12/PR-143 board)



A ≒ B

OUTPUT
(TP9/IE-28 board)

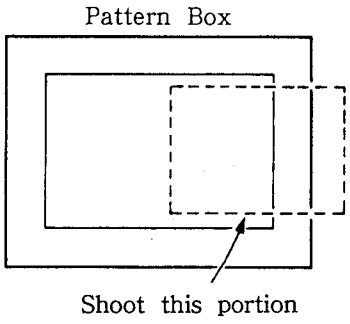


3-5-12. 1H OUT Phase Adjustment

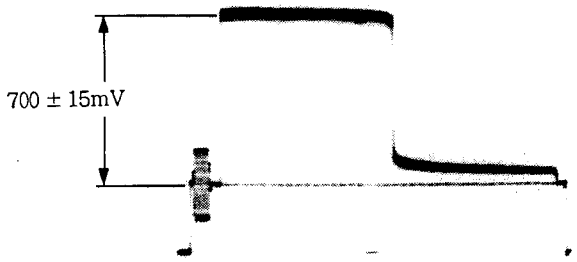
Note: Perform this adjustment only when replacing a DL1 delay line on the IE-28 board.

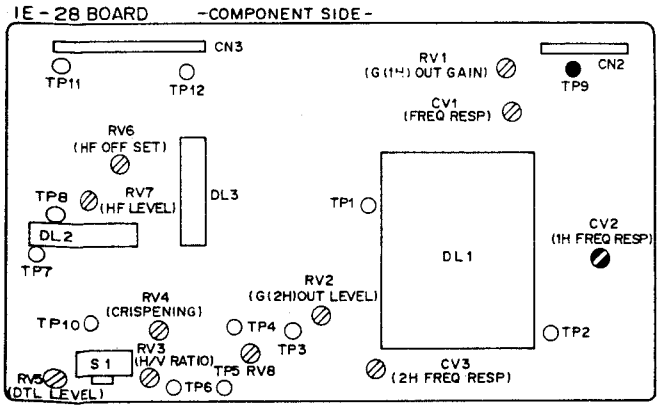
Object : White portion of pattern box
Equipment : Oscilloscope, Waveform monitor
To be extended : PR-143 board
Trigger : pin A5/extension board
Adjustment :

1. Shoot the white portion of the pattern box as shown below.

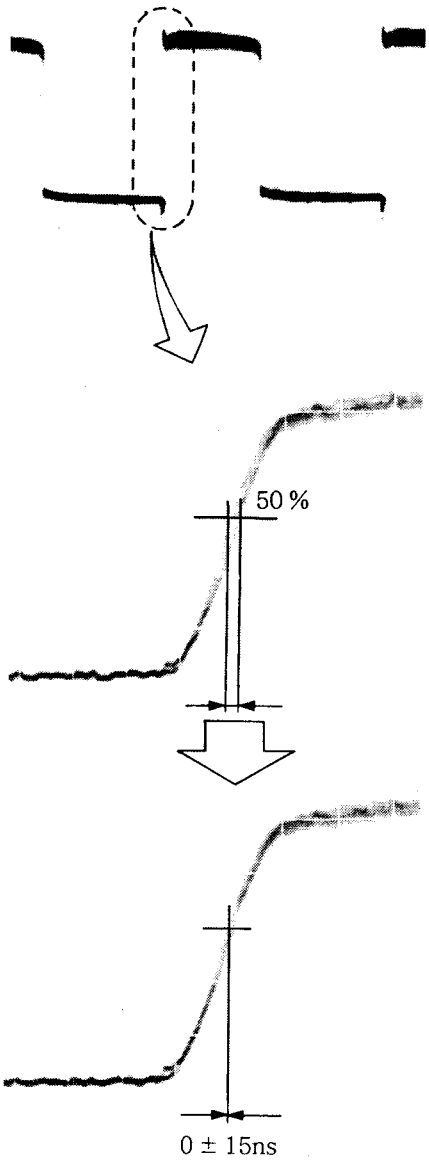


2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 15 mV.





3. Connect CH-1 of oscilloscope to TP9 (GND : E1) /PR-143 board.
4. Connect CH-2 of oscilloscope to TP9/IE-28 board (GND : pin A1/extension board).
5. Adjust ⊘CV2/IE-28 board so that the waveform phase between the CH1 and CH2 is coincided.

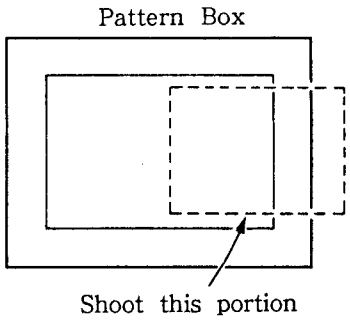


3-5-13. 2H OUT Phase Adjustment

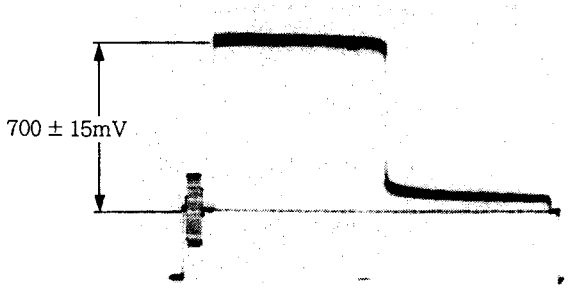
Note : Perform this adjustment only when replacing a DL1 delay line on the IE-28 board.

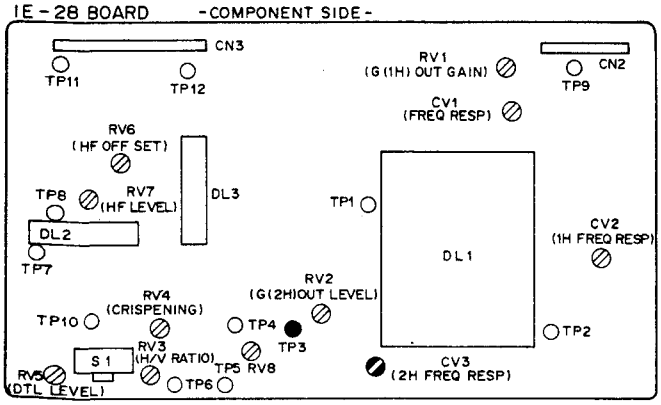
Object : White portion of pattern box
Equipment : Oscilloscope, Waveform monitor
To be extended : PR-143 board
Trigger : pin A5/extension board
Adjustment :

1. Shoot the white portion of the pattern box as shown below.

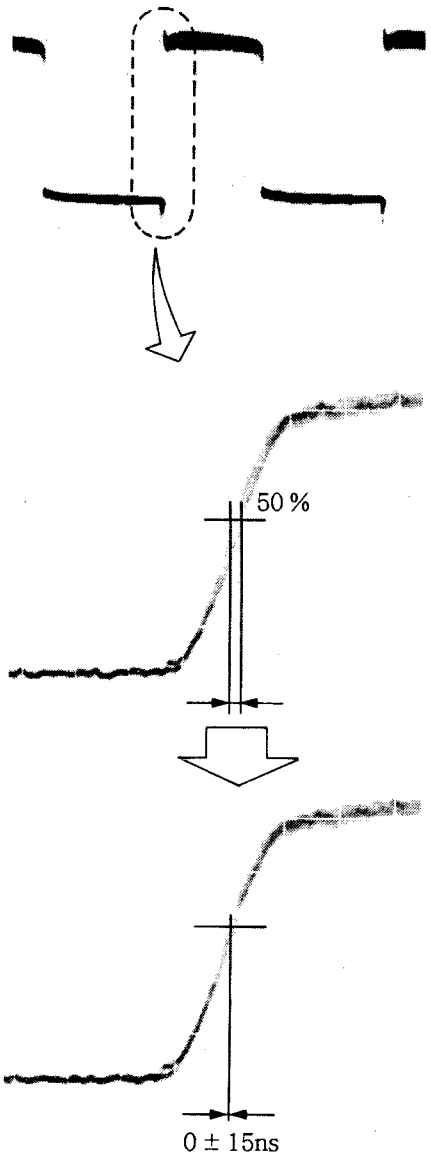


2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 15mV.





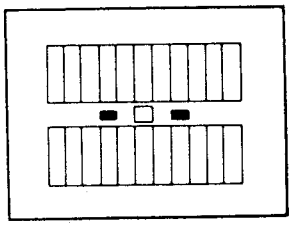
3. Connect CH-1 of oscilloscope to TP9 (GND : E1) /PR-143 board.
4. Connect CH-2 of oscilloscope to TP3/IE-28 board (GND : pin A1/extension board).
5. Adjust ◐CV3/IE-28 board so that the waveform phase between the CH1 and CH2 is coincided.



3-5-14. R/B PRESET WHITE Adjustment

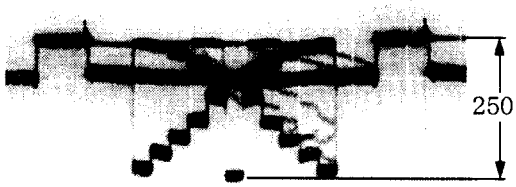
Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Trigger : pin A5/extension board
Adjustment :

1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.

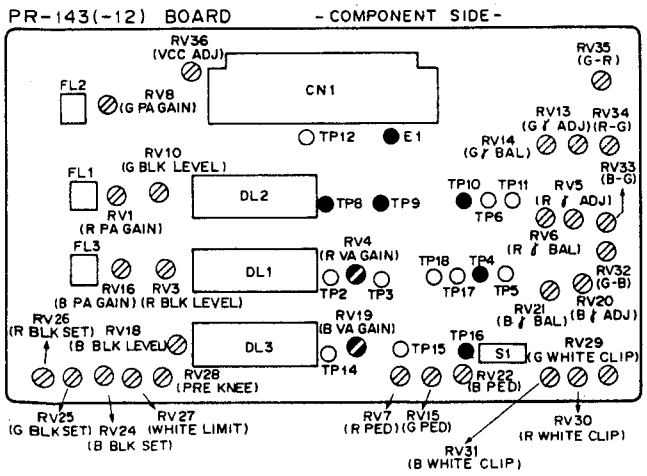


Monitor Screen

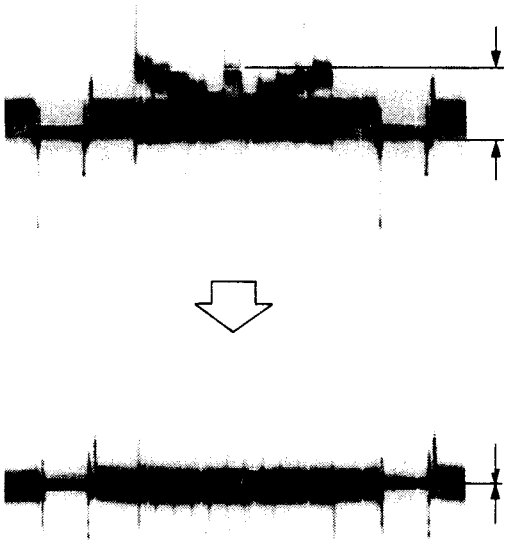
2. Adjust the iris control so that the video level at TP8 (GND : E1) / PR-143 board is 250 ± 5mV.



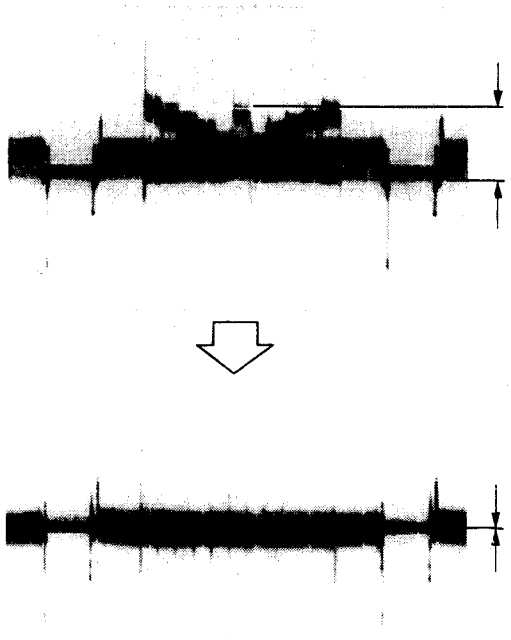
3. Set the oscilloscope to ADD mode and CH-2 INVERT mode.
4. Connect CH-1 and CH-2 of oscilloscope to TP9 (GND : E1) /PR-143 board.
   Adjust CH2-VAR control on the oscilloscope so that the waveform becomes flat for gain correction.



5. Connect CH-1 of oscilloscope to TP10 (GND : E1) and CH-2 to TP4 (GND : E1) on the PR-143 board. Adjust ◐RV4/PR-143 board so that the waveform becomes flat.



6. Connect CH-1 of oscilloscope to TP10 (GND : E1) and CH-2 to TP16 (GND : E1) on the PR-143 board. Adjust ◐RV19/PR-143 board so that the waveform becomes flat.

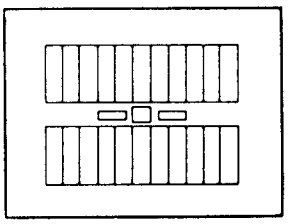


3-5-15. G ch Gamma Balance and Gamma Set Adjustment

Note : After this adjustment, perform the item 3-5-16. and the item 3-5-17. adjustment.

Object : Grayscale chart
Equipment : Oscilloscope,
To be extended : PR-143 board
Trigger : pin A5/extension board
Adjustment :

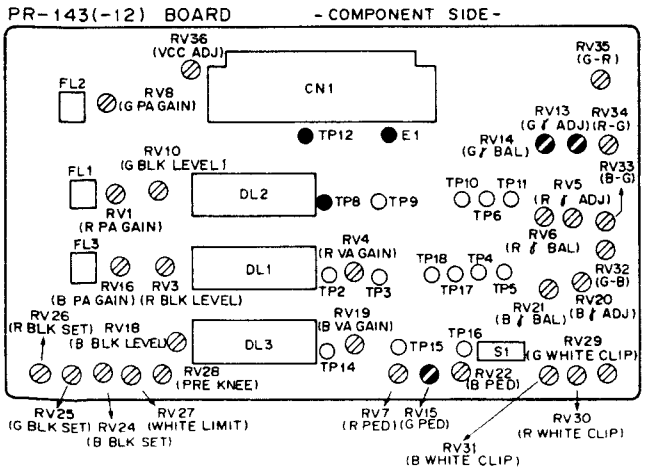
1. Adjust the zoom control so that the grayscale chart frame matches the underscanned picture frame on the screen.



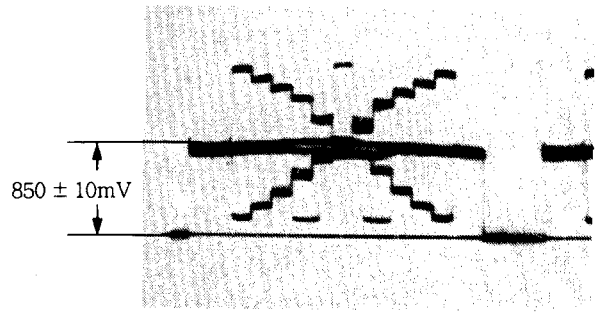
Monitor Screen

2. Adjust the iris control so that the video level at TP8 (GND : E1) / PR-143 board is 250 ± 5mV on the oscilloscope.

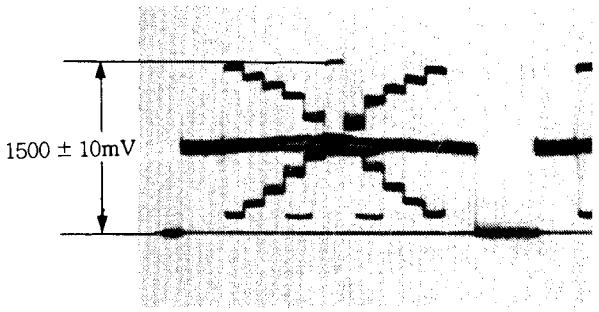
3. Connect a probe of oscilloscope to TP12 (GND : E1) / PR-143 board.



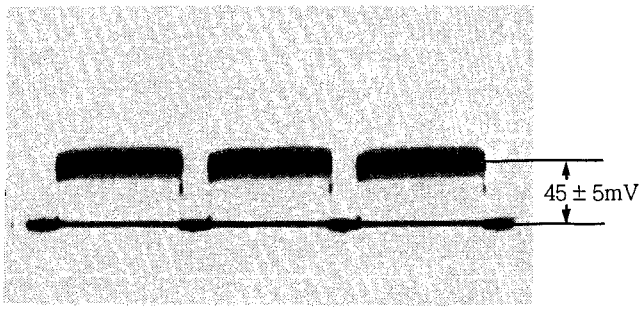
4. Adjust ⊘RV13/PR-143 board so that the cross point level of the video singal is 850 ± 10mV.



5. Adjust ⊘RV14/PR-143 board so that the white level of grayscale chart is 1500 ± 10mV.



6. Cover the lens with lens cap.
7. Adjust ⊘RV15/PR-143 board so that the pedestal level is 45 ± 5mV.



8. Remove the lens cap.
9. Repeat procedure 4 through procedure 8 several times.
10. Do not adjust the iris control until the item 3-5-16. and the item 3-5-17. are completed.

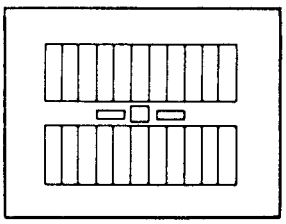
3-5-16. R ch Gamma Balance Adjustment

Note : The item 3-5-15. must be done before this adjustment.

Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Preparation :
- WHITE BAL switch (camera side panel) → PRESET
- Set the OUTPUT switch on the side of the camera to CAM.

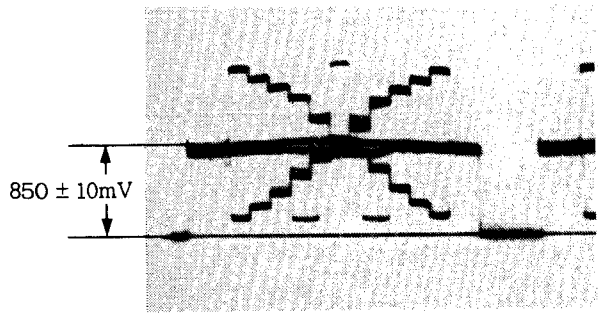
Trigger : pin A5/extension board
Adjustment :

1. Adjust the zoom control so that the Grayscale chart frame matches the underscanned picture frame on the screen.

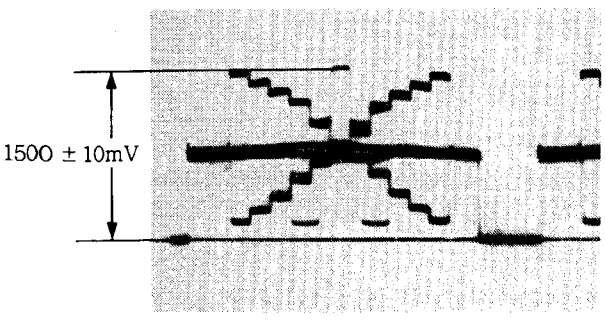


Monitor Screen

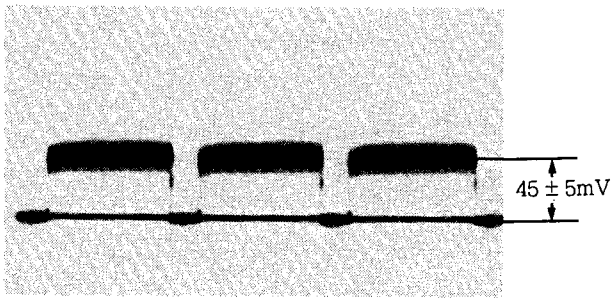
2. Make sure that the video level at TP8 (GND : E1) / PR - 143 board is 250 ± 5mV.
3. Connect a probe of oscilloscope to TP6 (GND : E1) / PR - 143 board.
4. Adjust ⊘RV5/PR-143 board so that the crosspoint level of the video signal is 850 ± 10mV.



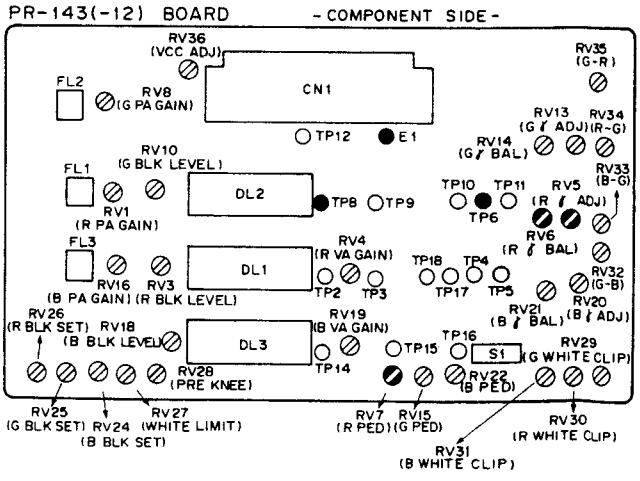
5. Adjust ⊘RV6/PR-143 board so that the white level of grayscale chart is 1500 ± 10mV.



6. Cover the lens with lens cap.
7. Adjust ⊘RV7/PR-143 board so that the pedestal level is 45 ± 5mV.



8. Remove the lens cap.
9. Repeat procedure 4 through procedure 8 several times.
10. Do not adjust the iris control until the item 3-5-17. are completed.



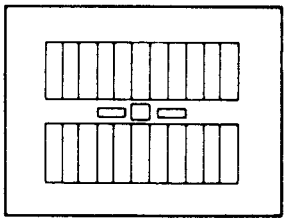
3-5-17. B ch Gamma Balance Adjustment

Note : The item 3-5-15. must be done before this adjustment.

Object : Grayscale chart
Equipment : Oscilloscope
To be extended : PR-143 board
Preparation :
- WHITE BAL switch (camera side panel) → PRESET
- Set the OUTPUT switch on the side of the camera to CAM.

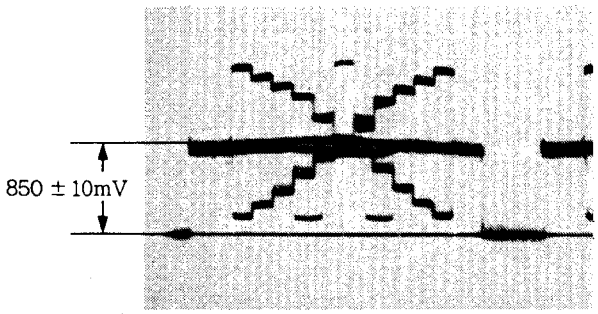
Trigger : pin A5/extension board
Adjustment :

1. Adjust the zoom control so that the Grayscale chart frame matches the underscanned picture frame on the screen.

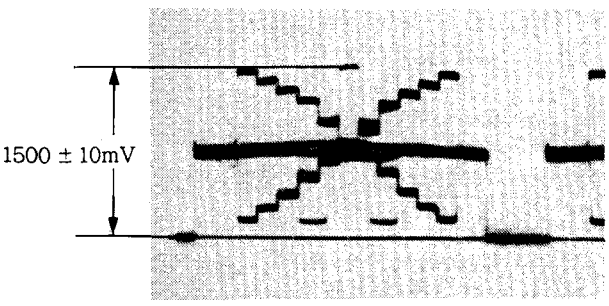


Monitor Screen

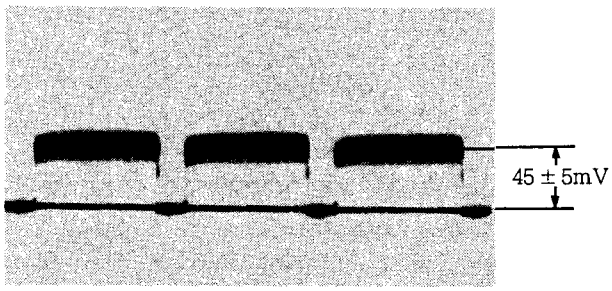
2. Make sure that the video level at TP8 (GND : E1) /PR -143 board is 250 ± 5mV.
3. Connect a probe of oscilloscope to TP18 (GND : E1) /PR -143 board.
4. Adjust ◐RV20/PR-143 board so that the cross point level of the video signal is 850 ± 10mV.



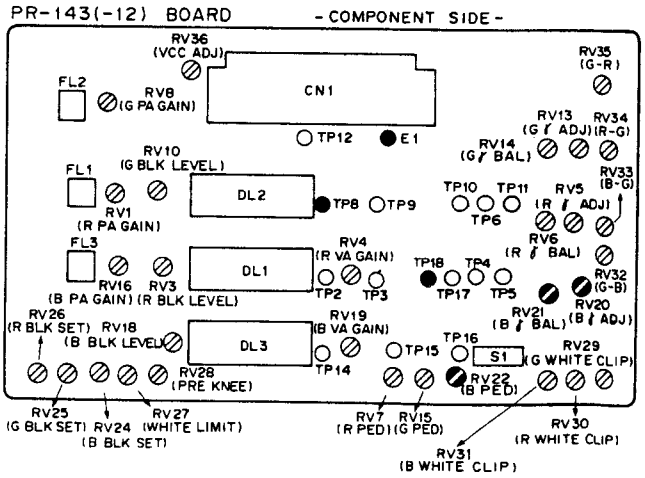
5. Adjust ◐RV21/PR-143 board so that the white level of grayscale chart is 1500 ± 10mV.



6. Cover the lens with lens cap.
7. Adjust ◐RV22/PR-143 board so that the pedestal level is 45 ± 5mV.



8. Remove the lens cap.
9. Repeat procedure 4 through procedure 8 several times.

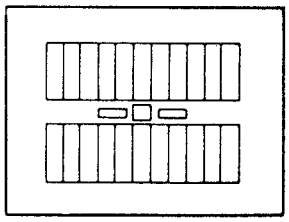


Note : After adjustment is completed, perform the item 3-5-16. R/B-ch Gamma Balance Adjustment.

3-5-18. R/B ch Gamma Set and Preset Adjustment

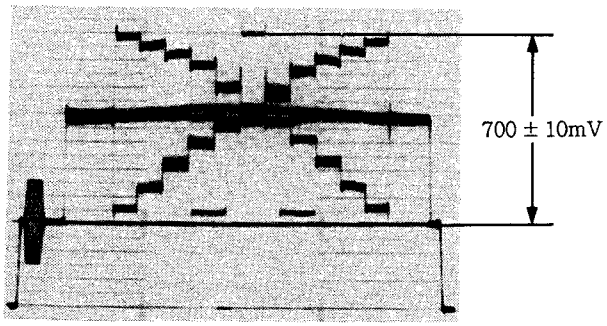
Object : Grayscale chart
Equipment : Waveform monitor, Vectorscope (MAX GAIN)
To be extended: PR-143 board
Adjustment :

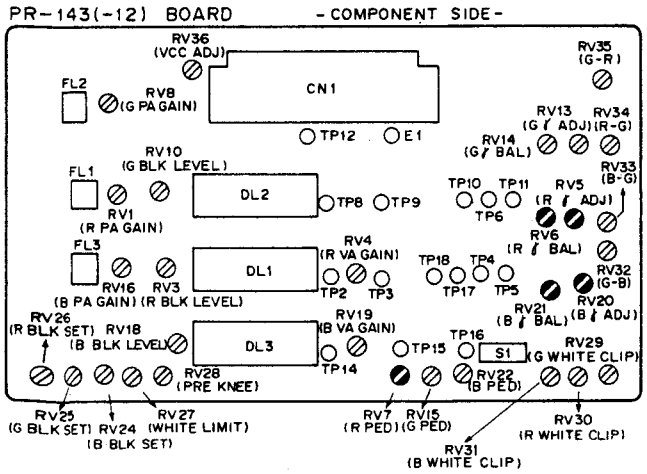
1. Adjust the zoom control so that the Grayscale chart frame matches the underscanned picture frame on the screen.



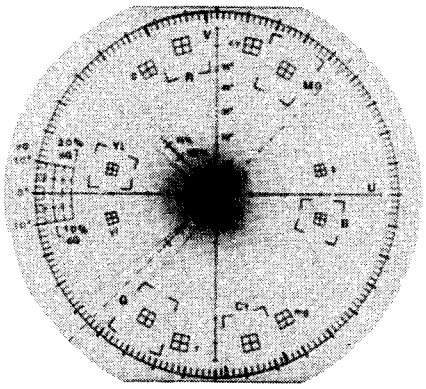
Monitor Screen

2. Adjust the iris control so that the video level is 700 ± 10mV on the waveform monitor.

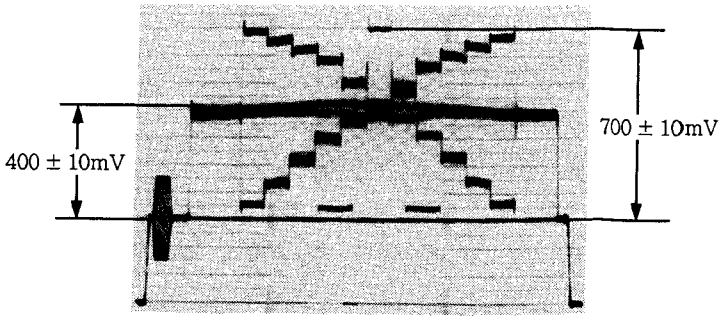




3. ●RV5/PR-143 board
   ●RV20/PR-143 board
   Alternately adjust the above two controls several times so that the beam spot is in the center of vectorscope.
4. ●RV6/PR-143 board
   ●RV21/PR-143 board
   Alternately adjust the above two controls several times so that the beam spot is in the center of vectorscope.



5. Cover the lens with lens cap.
6. Alternately adjust ●RV7 and ●RV22 on the PR-143 board several times so that beam spot is in the center of vectorscope.
7. Remove the lens cap.
8. Repeat procedure 3 through procedure 7 several times.
9. After the adjustment, the following specifications must be met.
   If not, perform from Item 3-5-2. G ch Video Level Adjustment once more.



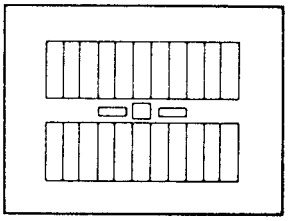
3-5-19. White Clip Adjustment

Object : Grayscale chart
Equipment : Waveform monitor
To be extended : PR-143 board
Preparation :

- Set the OUTPUT switch on the side of the camera to CAM.
- Set the GAIN switch on the side of the camera to 18 dB.

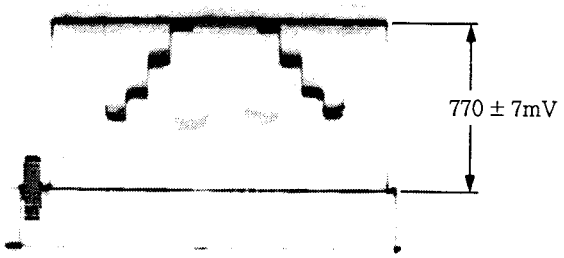
Adjustment :

1. Adjust the zoom control so that the Grayscale chart frame matches the underscanned picture frame on the screen..

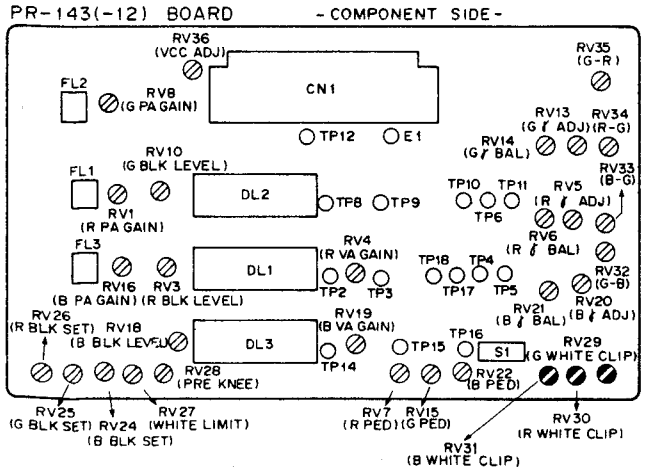


Monitor Screen

2. Open the lens iris fully.
3. Adjust ◐RV30, ◐RV31/PR-143 board several times so that the carrier leakage of the white peak level is minimized.
4. Adjust ◐RV29/PR-143 board so that the white peak level is 770 ± 7mV on the waveform monitor.



5. Repeat the steps 3 and 4 several times.



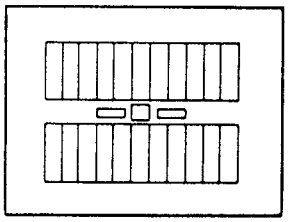
Note : After adjustment is completed, set the GAIN switch on the side of the camera to 0dB.

3-6. IMAGE ENHANCER SYSTEM ADJUSTMENT (IE-28 board)

3-6-1. HF Offset Adjustment

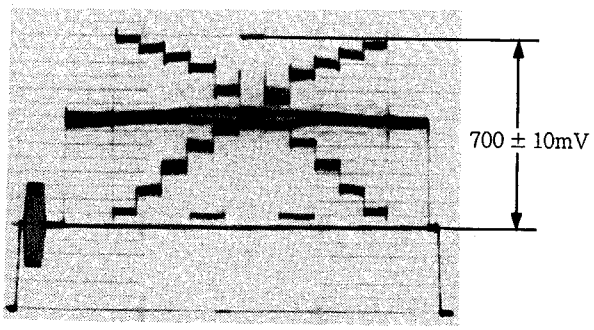
Object : Grayscale chart
Equipment : Oscilloscope, Waveform monitor
To be extended : PR-143 board
Trigger : pin A5/extension board
Adjustment :

1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.

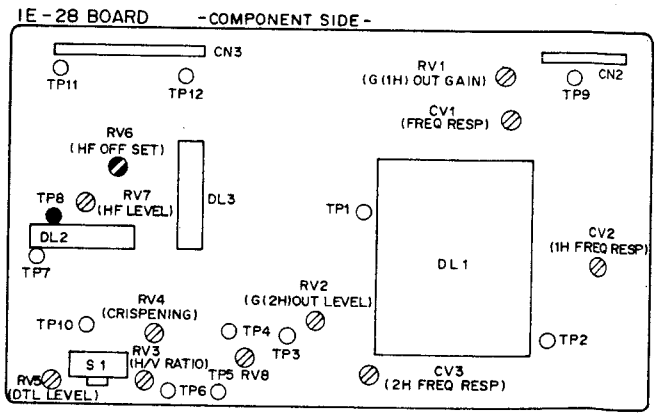


Monitor Screen

2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 10mV.



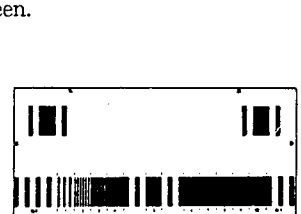
3. Adjust ⊘RV6/IE-26 board so that the DC offset level at TP8 (GND : E1) / IE-28 board is 0 ± 10 mV.



3-6-2. Aperture Adjustment

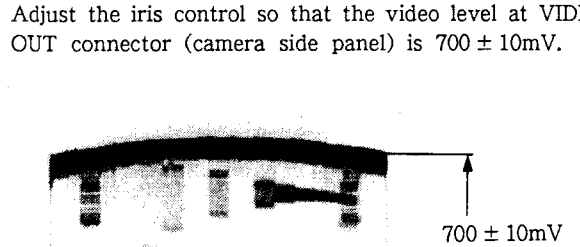
Object : Burst chart
Equipment : Waveform monitor
To be extended : PR-143 board
Preparation : DTL switch (S1) /IE-28→OFF
Adjustment :

1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.

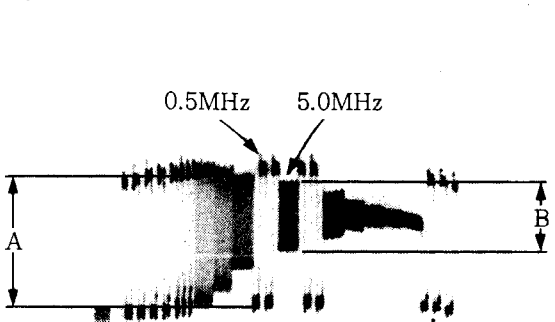


Monitor Screen

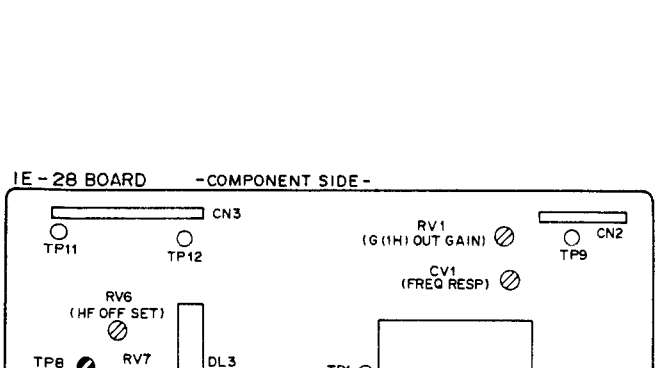
2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 10mV.



3. Adjust ⊘RV7/IE-28 board so that the ratio of 5MHz level "B" at VIDEO OUT connector (camera side panel) to 0.5MHz level "A" is 52 ± 5 %.
(To get the following picture , set the LINE SEL switch on the waveform monitor to "15 LINES ". And adjust the VAR control of LINE SEL.)



B = A × (52 ± 5 %)

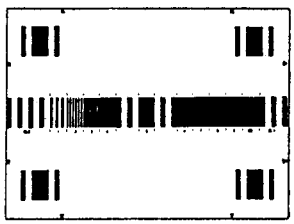


3-6-3. CRISPENING Adjustment

Note : Perform the adjustment only when replacing a ⊘ RV4 potentiometer on the IE-28 board.

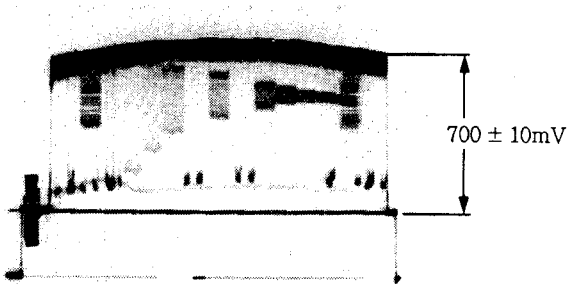
Object : Burst chart
Equipment : Oscilloscope,Waveform monitor
To be extended : PR-143 board
Test point : TP10/IE-28 board
(GND : pin A1/extension board)
Trigger : pin A5/ extension board
Preparation :
• ⊘ RV3/IE-28 board → fully clockwise ↺
• Set the GAIN switch on the side of the camera to 0 dB.
Adjustment point : ⊘ RV4/IE-28 board
Adjustment :

1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.

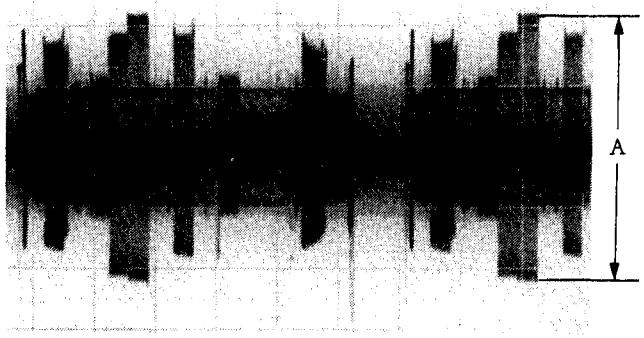


Monitor Screen

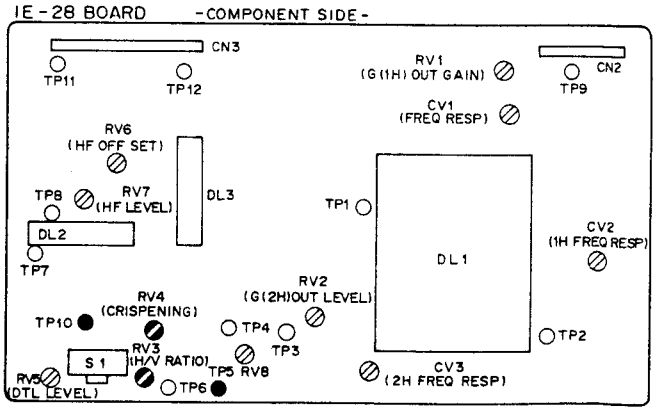
2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 10mV.



3. ⊘RV4/IE-28 board → fully counterclockwise ↺
4. Observe TP10/IE-28 board (GND : pin A1 /extension board) and measure the value of level "A".



5. Adjust ⊘RV4/IE-28 board so that the video level at TP10/IE-28 board (GND : pin A1/extension board) is 80 ± 5% of "A" measured in procedure 4.

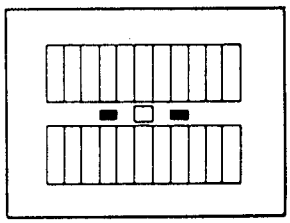


3-6-4. H. V. RATIO Adjustment

Object : Grayscale chart
Equipment : B/W monitor, waveform monitor
To be extended : PR-143 board
Preparation :
- Set the S1 (DTL) switch on the IE-28 board to ON.
- Set the WHITE BAL switch on the side of the camera to PRESET.

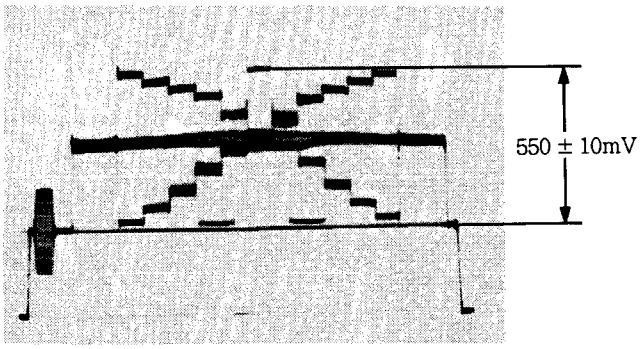
Adjustment point : ◐ RV3/IE-28 board
Adjustment :

1. Adjust the zoom control so that the Grayscale chart frame matches the underscanned picture frame on the screen.

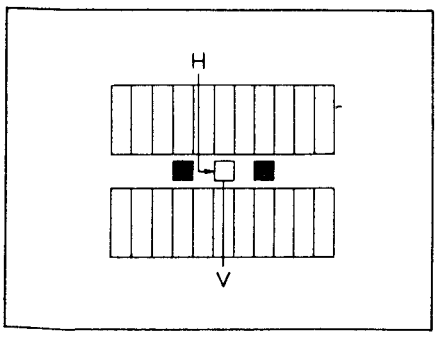


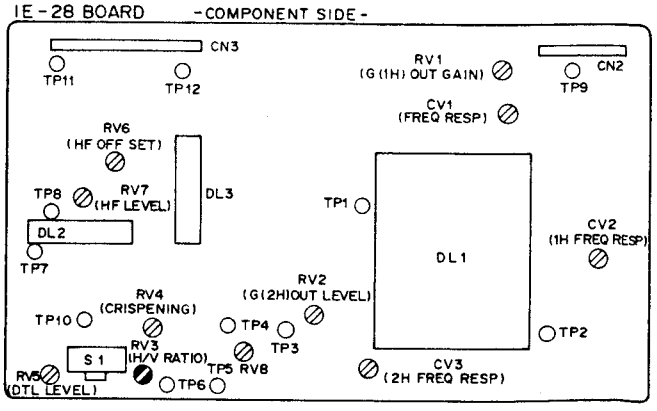
Monitor Screen

2. Adjust the iris control so that the video level is 550 ± 10mV on the waveform monitor.



3. Observing the indicated point on the B/W monitor (See the figure below), adjust ◐RV3/IE-28 board so that the DTL H and V are balanced.



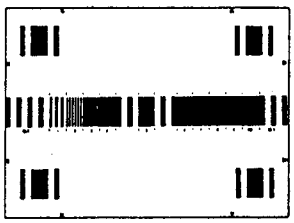


3-6-5. Detail Level Adjustment

Object : Burst chart
Equipment : Waveform monitor
To be extended : PR-143 board
Preparation :
- Set the WHITE BAL switch on the side of the camera to PRESET.
- DTL switch (S1) /IE-28 → ON

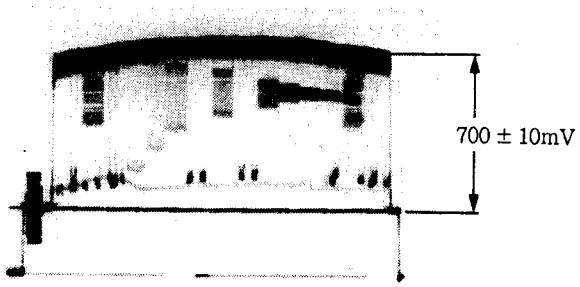
Adjustment point : ● RV5/IE-28 board
Adjustment :

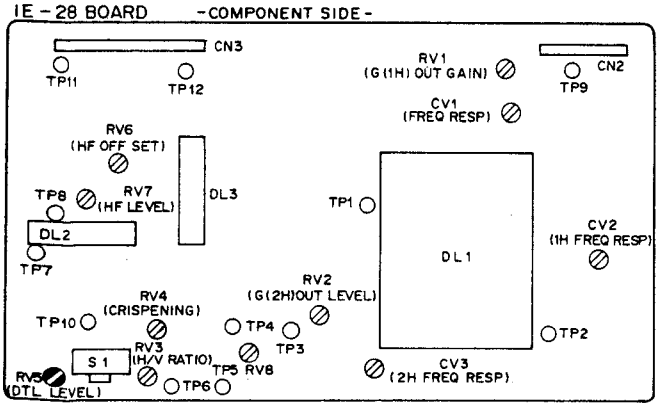
1. Adjust the zoom control of the lens so that the chart frame matches the underscanned picture frame on the screen.



Monitor Screen

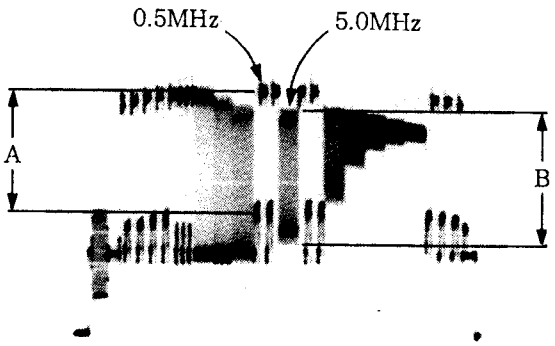
2. Adjust the iris control so that the video level at VIDEO OUT connector (camera side panel) is 700 ± 10mV.





3. Adjust ●RV5/IE-28 board so that the 5MHz level "B" at VIDEO OUT connector (camera side panel) is 105 ± 5% of 0.5MHz level "A".

(To get the following picture , set the LINE SEL switch on the waveform monitor to "15 LINES ". And adjust the VAR control of LINE SEL.)



$$B = A \times (105 \pm 5\%)$$

4. Repeat the 3-6-4. H.V.RATIO Adjustment to the 3-6-5. Detail Level Adjustment several times.

3-7. AUTO SYSTEM (AT-59 board)

3-7-1. LOW LIGHT Adjustment

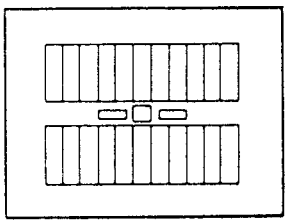
Object : Grayscale chart
Equipment : Waveform monitor
Preparation :

- Set the WHITE BAL switch on the side of the camera to PRESET.
- Press the DISP CHG button several times until the following (see illustration below) display appears on the viewfinder screen.

L.L.IND	: ON
BATT	: 12.5V
WHITE	: PRESET
BLACK	: AUTO
GAIN	: 0DB
SHUTTER	: OFF

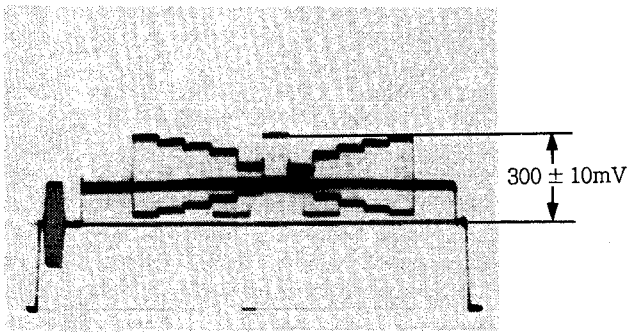
Adjustment point : ⊘ RV1/AT-59 board
Adjustment :

1. Adjust the zoom control so that the Grayscale chart frame matches the underscanned picture frame on the screen.

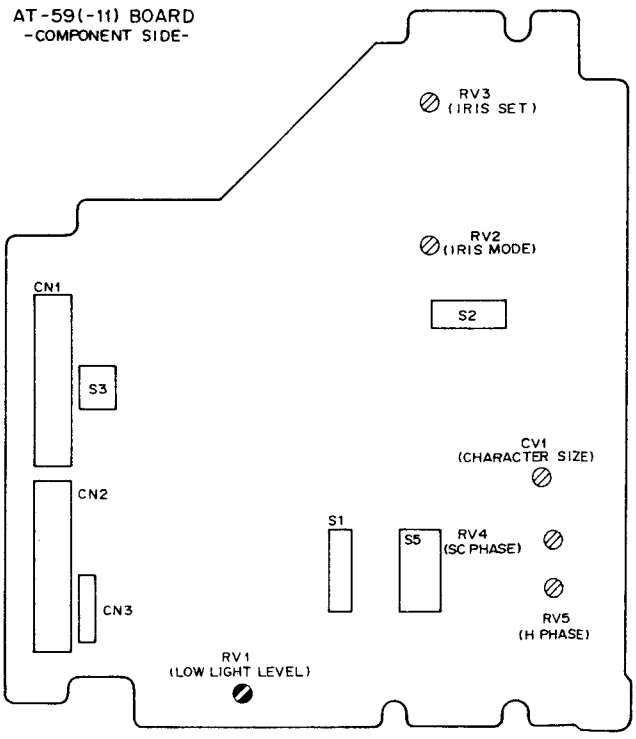


Monitor Screen

2. Adjust the lens iris control so that the white level of the video signal is 300 ± 10mV.



3. Rotate ⊘RV1/AT-59 board slowly counterclockwise from the rightmost position until the point where the "LOW LIGHT" indication and the "LOW LIGHT" lamp light up on the viewfinder screen.
4. Open the iris control gradually and confirm that the white level of the video signal is 330mV when the "LOW LIGHT" indication disappears, If the specification is not met, repeat procedure 3.

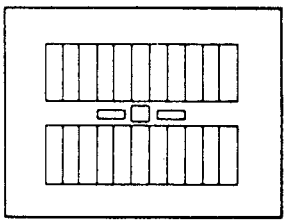


3-7-2. Auto Iris Adjustment

Object : Grayscale chart
Equipment : Waveform monitor
Preparation :
- Set the WHITE BAL switch on the side of the camera to PRESET.
- Set the iris control to AUTO
- Rotate ⊘ RV2(IRIS MODE)/AT-59 board fully clockwise ↻

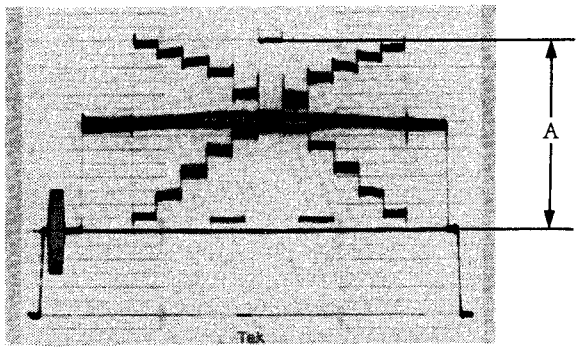
Adjustment :

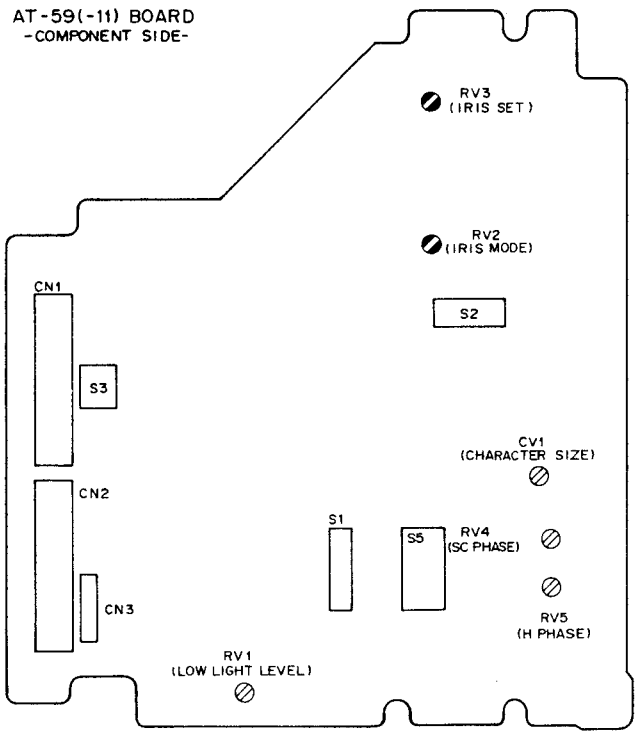
1. Adjust the zoom control so that the Grayscale chart frame matches the underscanned picture frame on the screen.



Monitor Screen

2. Adjust ⊘RV3 (IRIS SET) / AT-59 board so that the white peak level "A" is 700 ± 10mV.
3. Adjust ⊘RV2 (IRIS MODE) / AT-59 board so that the white peak level "A" is 742 ± 10mV.
4. Adjust ⊘RV3 (IRIS SET) / AT-59 board so that the white peak level "A" is 700 ± 10mV.

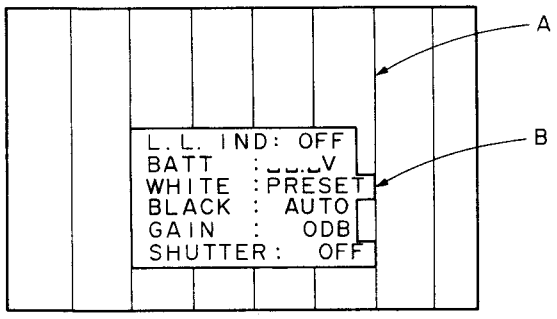


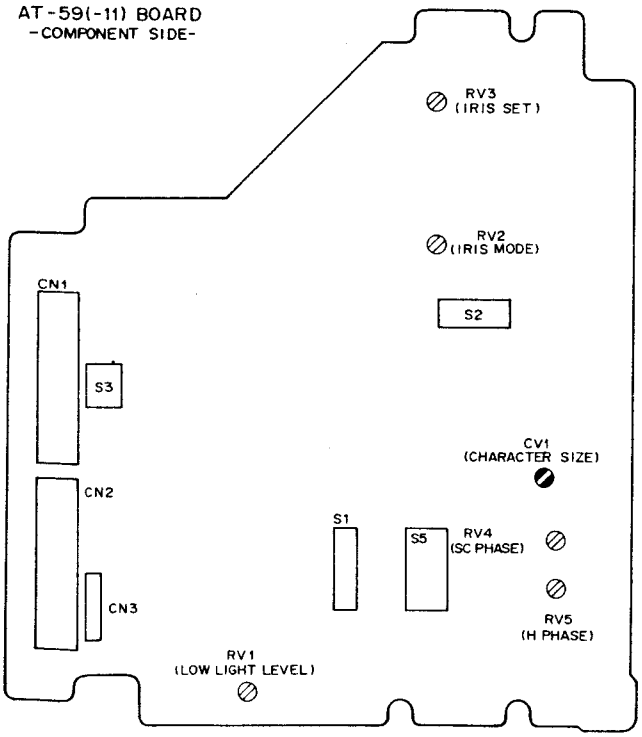


3-7-3. Character Size Adjustment

Test point : Viewfinder screen
Preparation :
• OUTPUT switch (camera side panel) → BARS
• DISP CHG switch (camera side panel) → ON
Adjustment point : ⊘CV1/AT-59 board
Adjustment :
Adjust ⊘ CV1/AT-59 board so that the "B " line on white block for character display matches the "A" line on color bar screen.

Viewfinder Screen

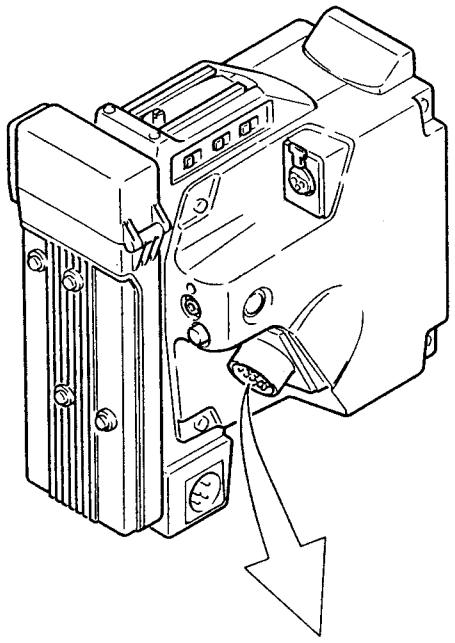




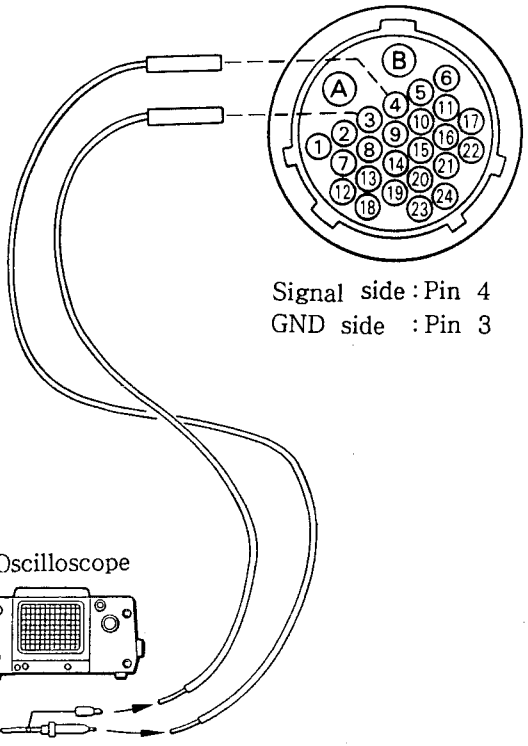
3-8. INTERFACE SYSTEM (IF-313 BOARD/CA-537P)

3-8-1. Y OUT Level Adjustment

Connection :

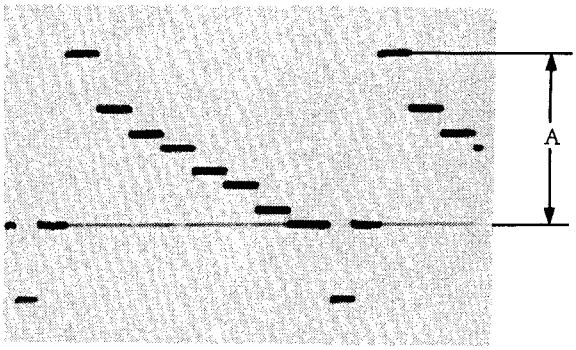


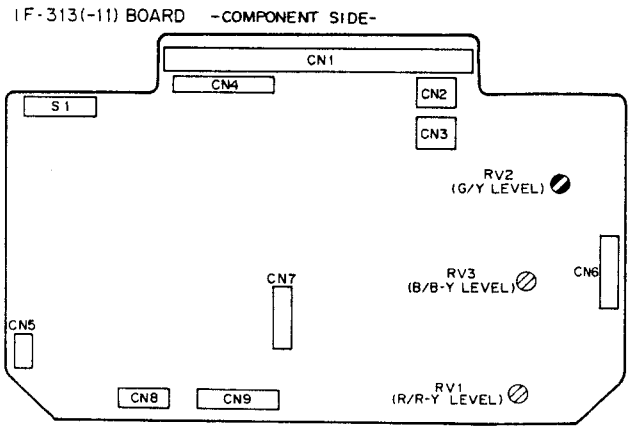
CCZ Connector (male)
— EXT VIEW —



Signal side : Pin 4
GND side : Pin 3

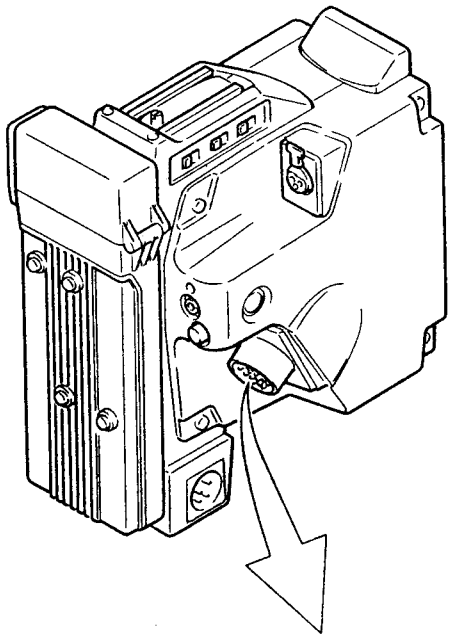
Equipment : Oscilloscope
Preparation :
• OUTPUT switch/camera side panel → BARS
• S1/IF-313 board → center position
Adjustment point : ⊘ RV2/IF-313 board
Specification :
A = 1400 ± 20mV
A = 700 ± 10mV (75 Ω termination)



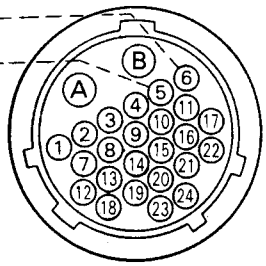


3-8-2. R-Y OUT Level Adjustment

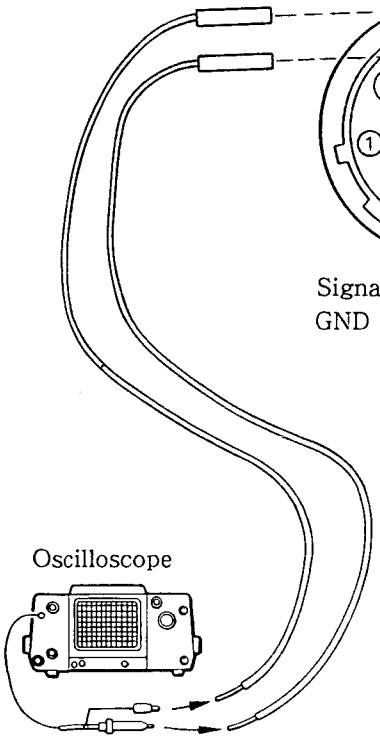
Connection :



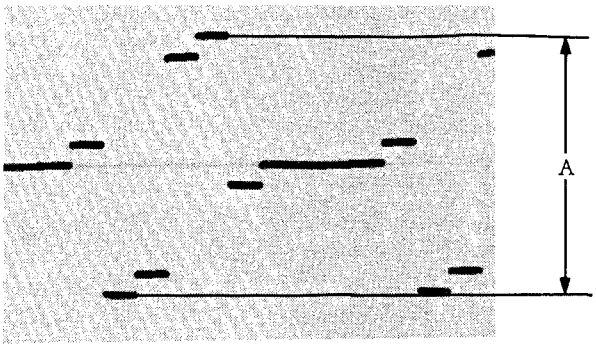
CCZ Connector (male)
— EXT VIEW —

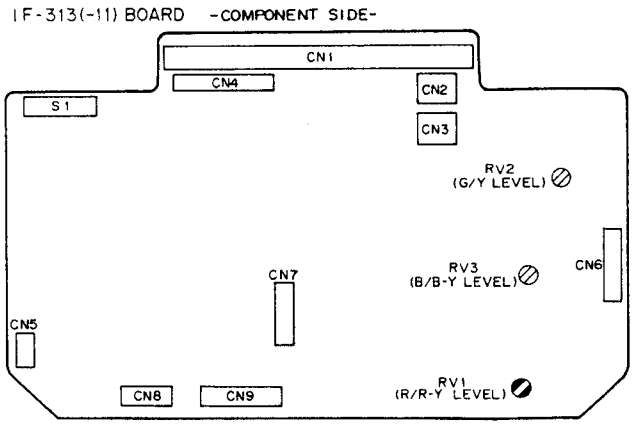


Signal side : Pin 5
GND side : Pin 6



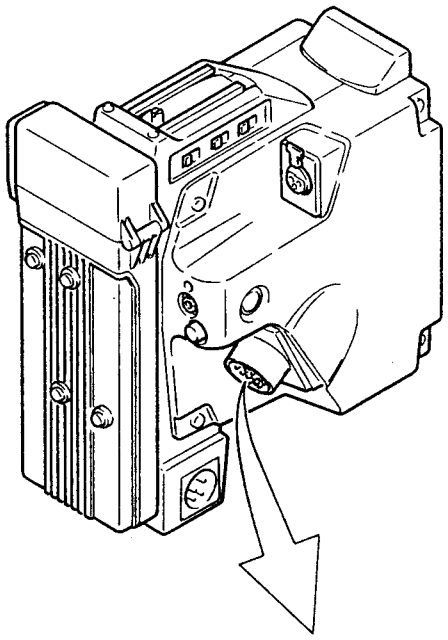
Equipment : Oscilloscope
Preparation :
• OUTPUT switch/camera side panel → BARS
• S1/IF-313 board → center position
Adjustment point : ◐RV1/IF-313 board
Specification :
A = 1050 ± 20mV
A = 525 ± 10mV (75 Ω termination)



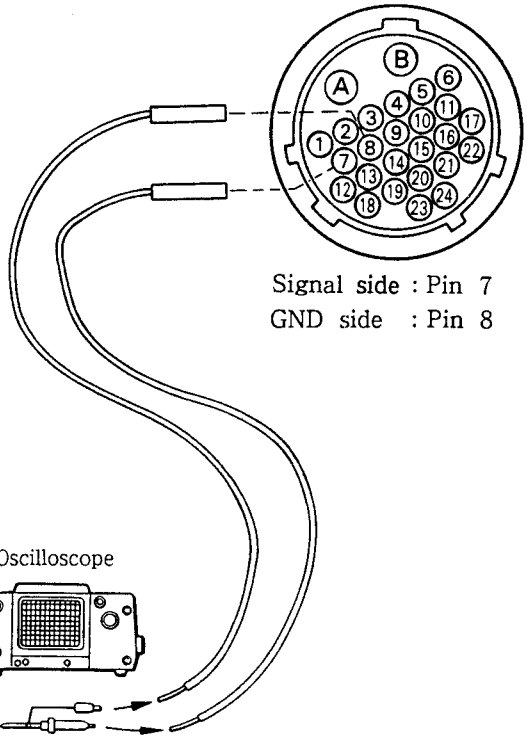


3-8-3. B-Y OUT Level Adjustment

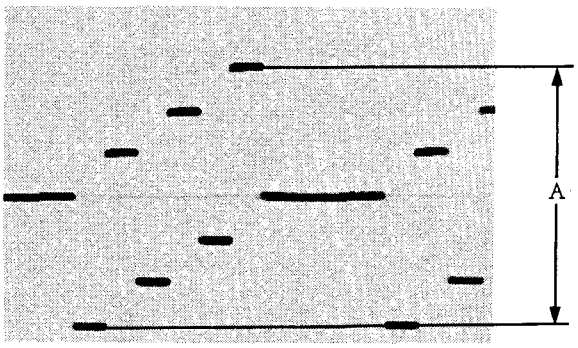
Connection :

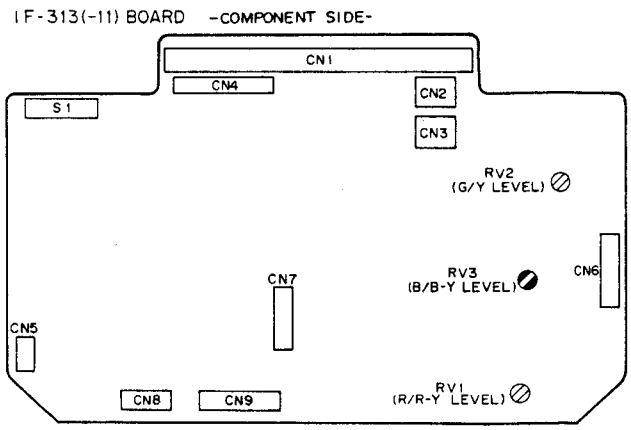


CCZ Connector (male)
— EXT VIEW —



Equipment : Oscilloscope
Preparation :
• OUTPUT switch/camera side panel → BARS
• S1/IF-313 board → center position
Adjustment point : ⊘RV3/IF-313 board
Specification :
A = 1050 ± 20mV
A = 525 ± 10mV (75 Ω termination)

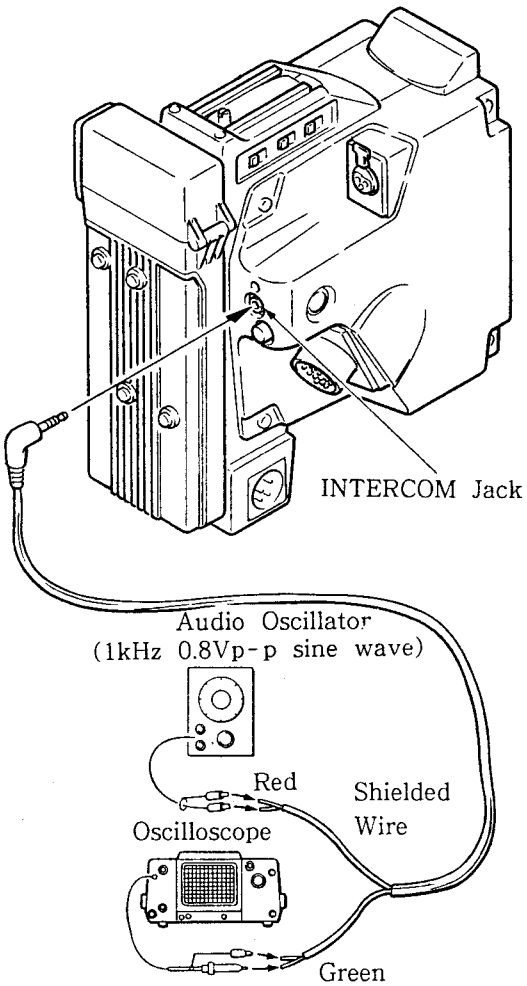




3-9. INTERCOM SYSTEM
(AU-141 BOARD/CA-537P)

3-9-1. SIDE TONE Adjustment

Equipment/Connection :

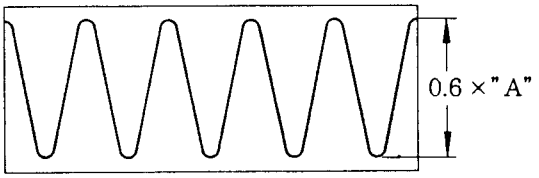


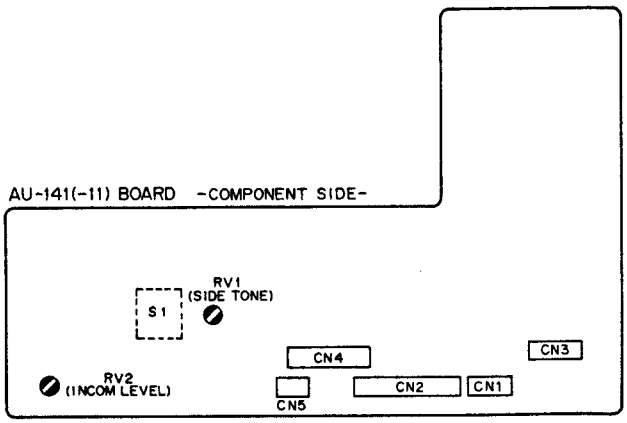
Preparation : Rotate ⊘RV2 on the AU-141 board fully clockwise ↻

Adjustment point : ⊘RV1/AU-141 board

Adjustment :

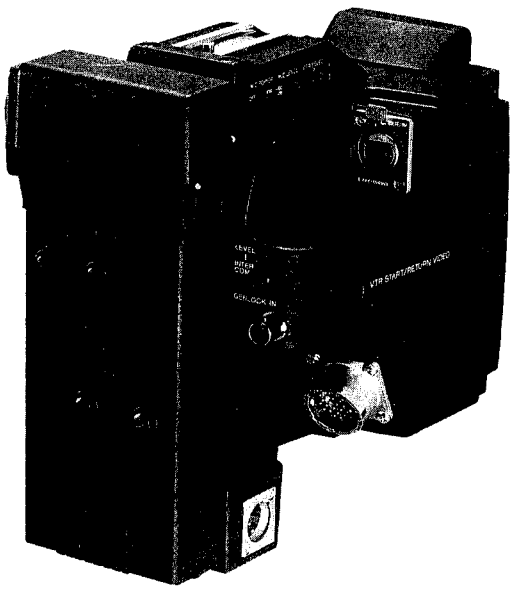
1. Measure the output level "A" when turning ⊘RV1 fully counterclockwise.
2. Adjust ⊘RV1 clockwise so that 60% of output level "A" is indicated.





CA-537

CAMERA ADAPTOR



SPECIFICATIONS

Inputs/Outputs	VTR/CCU/CMA connector: Sony Z-type, 26-pin
	DC IN: XLR-type, 4-pin
	MIC IN: XLR-type, 3-pin
	GEN LOCK IN: BNC-type
	EARPHONE: mini jack
	INTERCOM: mini intercom jack
Power requirements	
	12 V DC
Power consumption	
	1.7 W
Operating temperature	
	−10°C to +45°C (14°F to 113°F)
Storage temperature	
	−20°C to +60°C (−4°F to +140°F)
Weight	1.3 kg (2 lb 14 oz)
Dimensions	118 × 205 × 187 mm
	($4^{3}/_{4} \times 8^{1}/_{3} \times 7^{3}/_{8}$ inches)
Supplied accessories	
	Screws for attaching the CA-537/537P
	M4 × 6 (2)
	M4 × 12 (2)
	Operating instructions (1)

Design and specifications are subject to change without notice.

SONY

SERVICE MANUAL

TABLE OF CONTENS

1. GENERAL DESCRIPTION

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2. SERVICE INFORMATION

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SECTION 1
GENERAL DESCRIPTION

1-1. PRECAUTIONS

The CA-537/537P is a camera adaptor designed to be used with the Sony DXC-537/537P series color video camera. This instruction manual is for both the CA-537 and the CA-537P.
The operating instructions for both camera adaptors are the same, but their signal systems and their color video cameras to be connected are different.

	Signal system	Color video camera
CA-537	EIA standards, NTSC color system	DXC-537 series camera
CA-537P	CCIR standards, PAL color system	DXC-537P series camera

Please refer to the camera's instruction manual for details of the camera adaptor's operation.

Operation

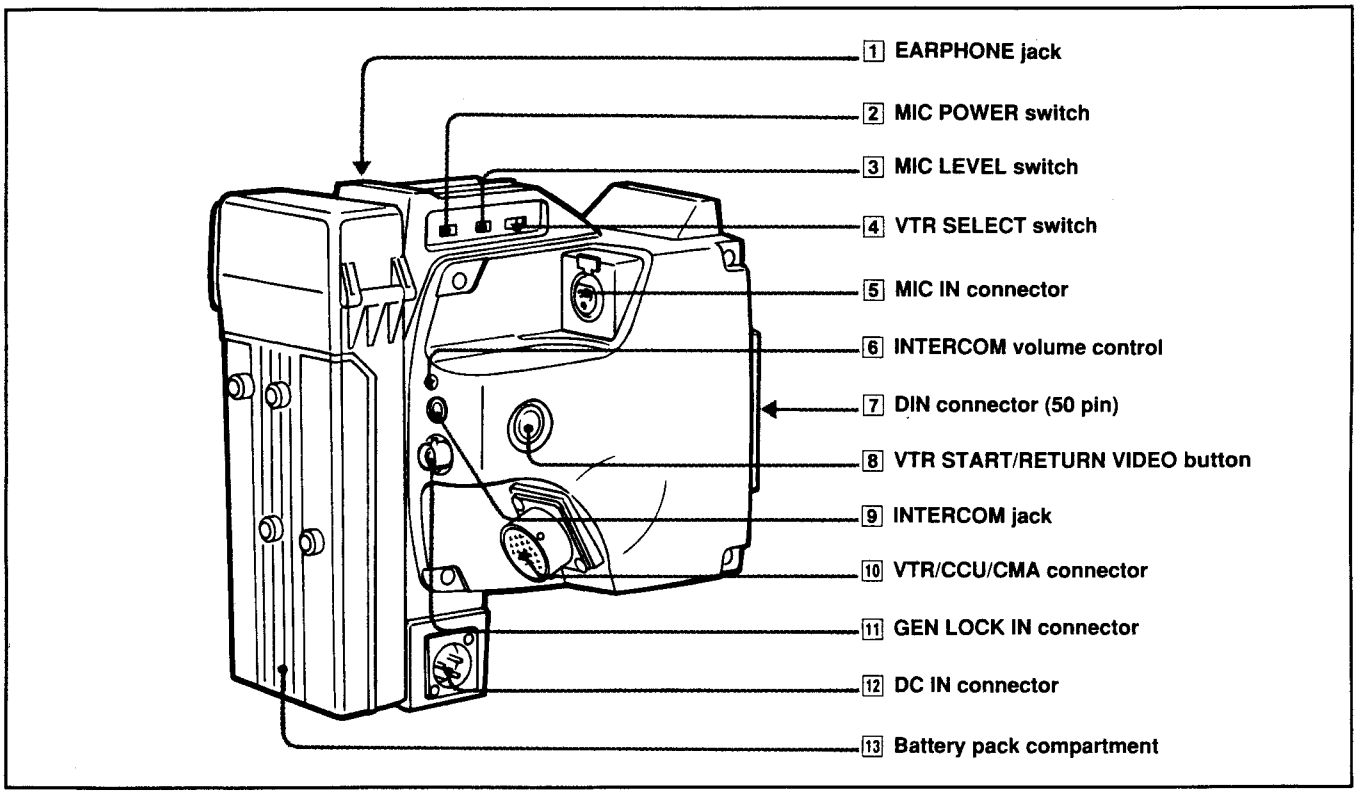
- Do not use the unit in a place subject to excessive dust, mechanical vibration or shock.
- Allow adequate air circulation to prevent internal heat build-up.
- Do not expose the unit to extremely high temperature and humidity.

Cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which might damage the finish.

If you have any questions about this unit, contact your authorized Sony dealer.

1-2. LOCATION AND FUNCTION OF PARTS


1 EARPHONE jack
2 MIC POWER switch
3 MIC LEVEL switch
4 VTR SELECT switch
5 MIC IN connector
6 INTERCOM volume control
7 DIN connector (50 pin)
8 VTR START/RETURN VIDEO button
9 INTERCOM jack
10 VTR/CCU/CMA connector
11 GEN LOCK IN connector
12 DC IN connector
13 Battery pack compartment

1 EARPHONE jack (mini jack)

Connect an earphone to monitor the playback or recording sound from the VTR.

Note

With some types of VTR, you may not be able to monitor the sound. For details, refer to the camera's operating instructions.

2 MIC POWER switch

Turns on or off the microphone connected to the MIC IN connector.

ON: When you use the microphone of a phantom powering system, set the switch to this position. The power is supplied to the microphone from the MIC IN connector.

OFF: When you use a microphone other than that of a phantom powering system, set the switch to this position.

3 MIC LEVEL switch

Set this switch according to the sensitivity of the MIC IN connector on the VTR and CCU. If the sensitivity is high, set it to a minimum of –20dB; if it is low, set it to a maximum of –60dB.

4 VTR SELECT switch

Selects the VTR depending on the type of the connected VTR. For details, refer to the camera's operating instructions.

1: For a Sony BVU-150/150P, BVW-35/35P or VO-6800/6800PS VTR, or a CCU-M7/M7P/M3/M3P camera control unit.

2: For a Panasonic VHS format AG-6400 VTR.

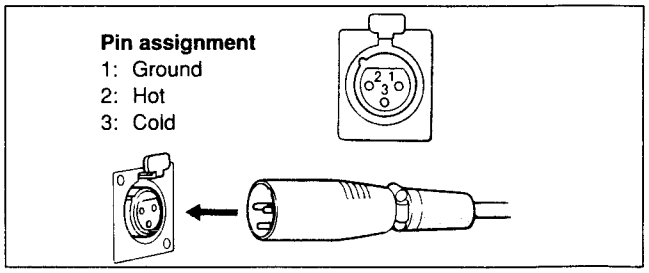
3: For a Sony VO-8800/8800PS VTR.
For a Panasonic S-VHS format AG-7400 VTR.

Caution

Be sure to set the VTR SELECT switch to the correct position for the VTR used. If it is not, the VTR might not operate properly.

5 MIC IN (microphone input) connector (XLR 3-pin)

You can connect a microphone here.



6 INTERCOM volume control

Controls the volume level through the DR-100 intercom headset.

7 DIN connector (50-pin)

Connect to the 50-pin connector on the camera head.

[8] VTR START/RETURN VIDEO button

When a portable VTR or CCU-M7/M7P/M3/M3P camera control unit is connected to the VTR/CCU/CMA connector, this button functions.

When the VTR is connected: Starts and stops the recording. Press the button to start recording, and press again to stop.

When the CCU-M7/M7P/M3/M3P camera control unit is connected: Monitors the return video picture on the viewfinder. Keep the button pressed to monitor the return video picture, and release it to monitor the camera picture.

[9] INTERCOM jack (mini jack)

Connect a DR-100 intercom headset, here. The DR-100 enables the communication between the camera operator and the person operating the connected CCU-M7/M7P/M3/M3P camera control unit or video switcher.

[10] VTR/CCU/CMA connector (26-pin)

Connect a portable VTR, CCU-M7/M7P/M3/M3P camera control unit or CMA-8A/8ACE camera adaptor. All video, audio, and control signals as well as power are supplied from/to the video camera via this connector.

[11] GEN LOCK IN (gen-lock input) connector (BNC connector)

When you synchronize two or more cameras without using a camera control unit, connect the gen-lock sync signal (VBS or BS) for synchronization here.

[12] DC IN (DC power input) connector (XLR 4-pin)

This connector is equipped for supplying power from an external DC power supply (12 VDC).

Pin assignment
1: GND
2: NC
3: NC
4: +12 VDC

Note

When DC current is supplied to this connector, power from the battery pack and from the VTR/CCU/CMA connector is automatically cut off.

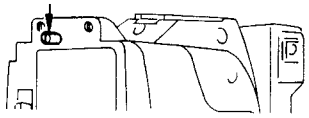
[13] Battery pack compartment

When using the power source from a battery pack, put an NP-1B or NP-1A battery pack into this compartment.

1-3. ATTACHING/DETACHING THE CA-537/537P

This section tells you how to attach the camera adaptor to the DXC-537/537P color video camera and how to take it off again. The CA-537/537P has a guide pin to ensure proper camera assembling. A camera which has no hole for the guide pin cannot be attached.

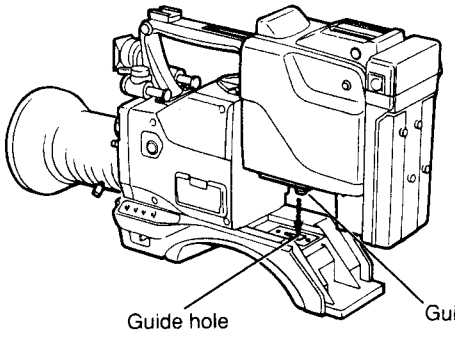
Guide pin



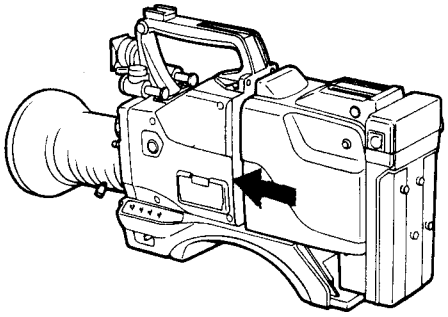
Attaching to the camera

1 Put the camera adaptor on the camera head with the guide in the guide hole.

Camera head



2 Push the camera adaptor forward along the groove until its 50-pin connector locks into the DIN 50-pin connector on the camera.

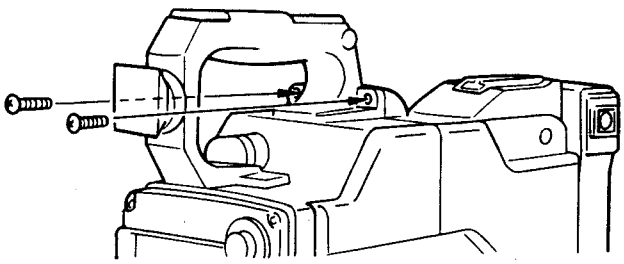


Detaching from the camera

To detach the camera adaptor, reverse the order of the instructions as shown below.

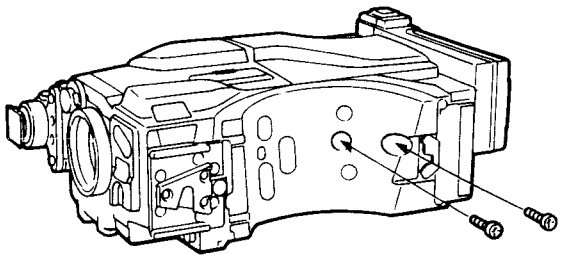
Attaching to the camera

3 Fix the camera adaptor to the camera with two screws at the connecting part.



Use the supplied screws
M4 × 12.

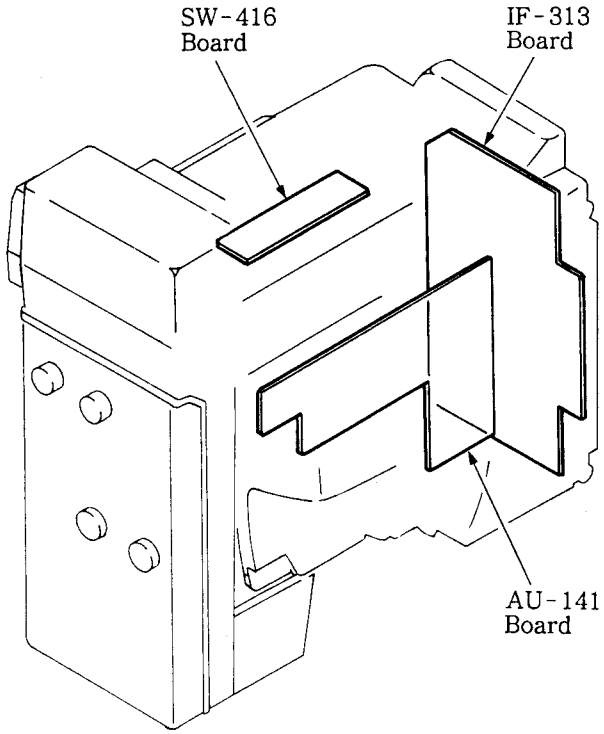
4 Tighten the two screws at the bottom of the shoulder pad on the camera.



Use the supplied screws
M4 × 6.

SECTION 2
SERVICE INFORMATION

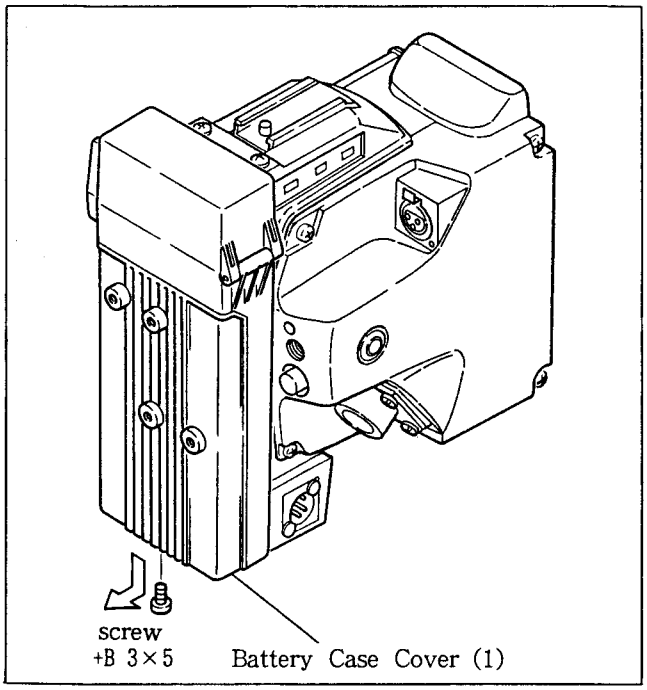
2-1. BOARD LAYOUT



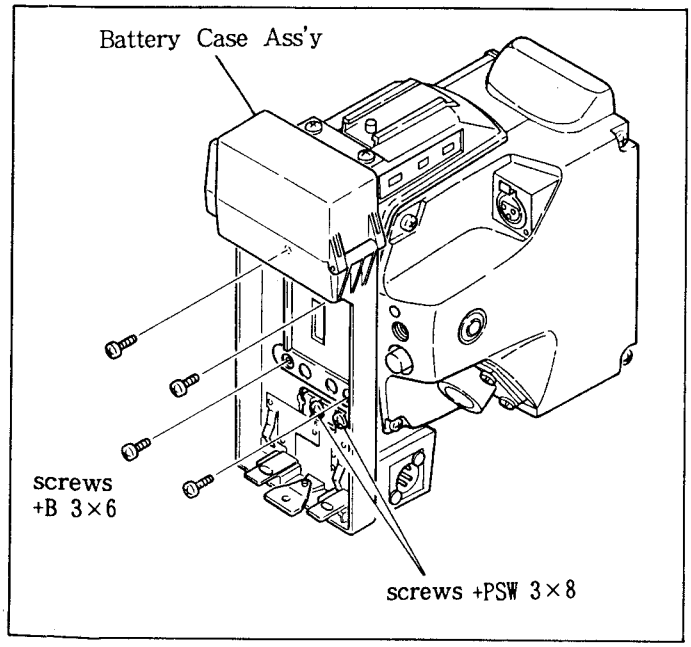
2-2. REMOVAL OF CABINET

2-2-1. Remove the Battery Case Ass'y

1. Remove the screw (+B 3×5) shown in the figure and remove the battrey case cover (1).

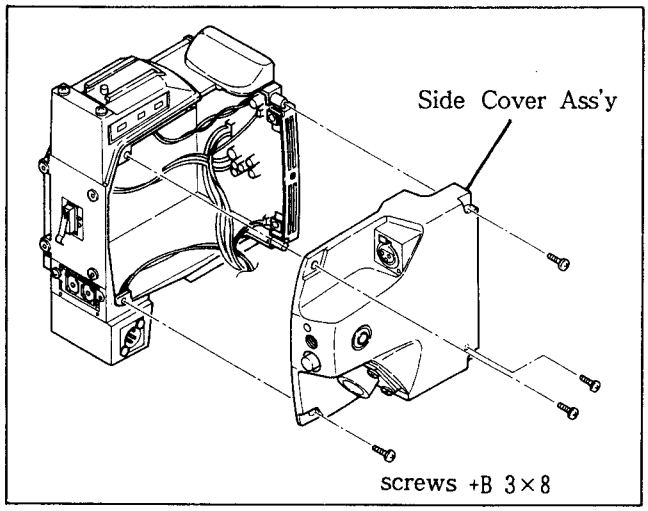


2. Remove the four screws (+B 3×6) and loosen the two screws (+PSW 3×8). Remove the battery case ass'y.



2-2-2. Remove the Side Cover Ass'y

1. Remove the four screws (+B 3×8) and remove the side cover ass'y.



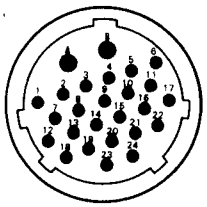
2-3. CONNECTORS AND CABLES

2-3-1. Connector Input/Output Signals

The main connector input/output signals are as follows :

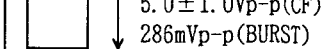
GENLOCK (BNC) : 1.0Vp-p, sync negative 75 Ω

VTR/CCU/CMA (26p, MALE)



(EXT VIEW)

No.	Signal	Specification
A	EXT DC(CCZ)IN(X)	10.5 to 17.0 Vdc (at3A)
B	EXT DC IN(G)	GND for POWER
1	EN VIDEO OUT(X)	VBS=1.0Vp-p±1dB(100%) Zo=75Ω±5% DC=0±100mV
2	EN/CF/CHROMA(G)	GND for ADP VIDEO
3	G/Y/Y OUT(G)	GND for Y
4	G/Y/Y OUT(X)	VS=1.0Vp-p±0.5dB(100%) Zo=75Ω±5% DC=0±200mV
5	R/R-Y/CHROMA OUT(X)	V=714/700/286mVp-p (BURST)±2% (75% COLOR BARS) Zo=75Ω±5% DC=0±200mV
6	R/R-Y/CHROMA OUT(G)	GND for R-Y
7	B/B-Y OUT(X)	V=714/700mVp-p±2% (75% COLOR BARS) Zo=75Ω±5% DC=0±200mV
8	B/B-Y OUT(G)	GND for B-Y
9	MIC OUT(X)	-60dBm/-20dBm Zo≦600Ω BALANCED
10	MIC OUT(Y)	
11	MIC OUT(G)	GND for MIC
12	VTR START/$\overline{\text{STOP}}$ OUT TALLY OUT	START: 4.5±0.5V STOP: 0±0.5V Zo≦10kΩ

No.	Signal	Specification
13	BATT IND IN/S DATE	Zi=300Ω (Note. 1)
14	SENS(+)IN	+2.5V
15	REC ALARM IN	Zi≧20kΩ (Note. 2)
16	GENLOCK IN(G)	
17	INCOM IN/OUT(G)	GND for AUDIO MONITOR
18	RET/PB VIDEO IN(X)	Zi=75Ω±5% VS=1.0Vp-p±1%(100%) DC=0±200mV
19	RET/PB VIDEC IN(G)	GND for PB VIDEO
20	AUDIO MONITOR IN	Zi=750Ω(1kHz) SAVE: 4.5±0.5V STANDBY:9.0+1.0V -0.5V Zo≧10kΩ
21	GENLOCK IN(X)	Zi=75Ω±5% VBS=1.0Vp-p
22	CF/CHROMA OUT(X)	 5.0±1.0Vp-p(CF) 286mVp-p(BURST) (CHROMA) Zo=1kΩ±5%(CF) 75Ω(CHROMA) DC block
23	INCOM IN/OUT(X)	Zo=600Ω
24	INCOM IN/OUT(Y)	Zo=600Ω

• VTR Connected

	VTR 1 (B-CAM. U)	VTR 2 (VHS)	VTR 3 (S-VHS)
	AUTO	AUTO	AUTO
1	EN VIDEO OUT (X)	EN VIDEO OUT (X)	※1 Y OUT (X)
2	EN VIDEO/CF OUT (G)	EN VIDEO/CF OUT (G)	Y/CHROMA OUT (G)
3	Y OUT (G)	———	———
4	※2 Y OUT (X)	———	———
5	R-Y OUT (X)	———	———
6	R-Y OUT (G)	———	———
7	B-Y OUT (X)	———	———
8	B-Y OUT (G)	———	———
22	CF OUT (X)	CF OUT (X)	CHROMA OUT (X)

• CCU Connected

	CCU		
	AUTO		
※3	Y/C	GBR	Y, B-Y, R-Y
1	EN VIDEO OUT (X)	EN VIDEO OUT (X)	EN VIDEO OUT (X)
2	EN VIDEO/ CF OUT (G)	EN VIDEO/ CF OUT (G)	EN VIDEO/ CF OUT (G)
3	Y OUT (G)	G OUT (G)	Y OUT (G)
4	※1 Y OUT (X)	G OUT (X)	※2 Y OUT (X)
5	CHROMA OUT (X)	R OUT (X)	R-Y OUT (X)
6	CHROMA OUT (G)	R OUT (G)	R-Y OUT (G)
7	———	B OUT (X)	B-Y OUT (X)
8	———	B OUT (G)	B-Y OUT (G)

※1 Y/C
※2 CONPONENT
※3 CCU-M7/M7P Rear Paner SWITCH

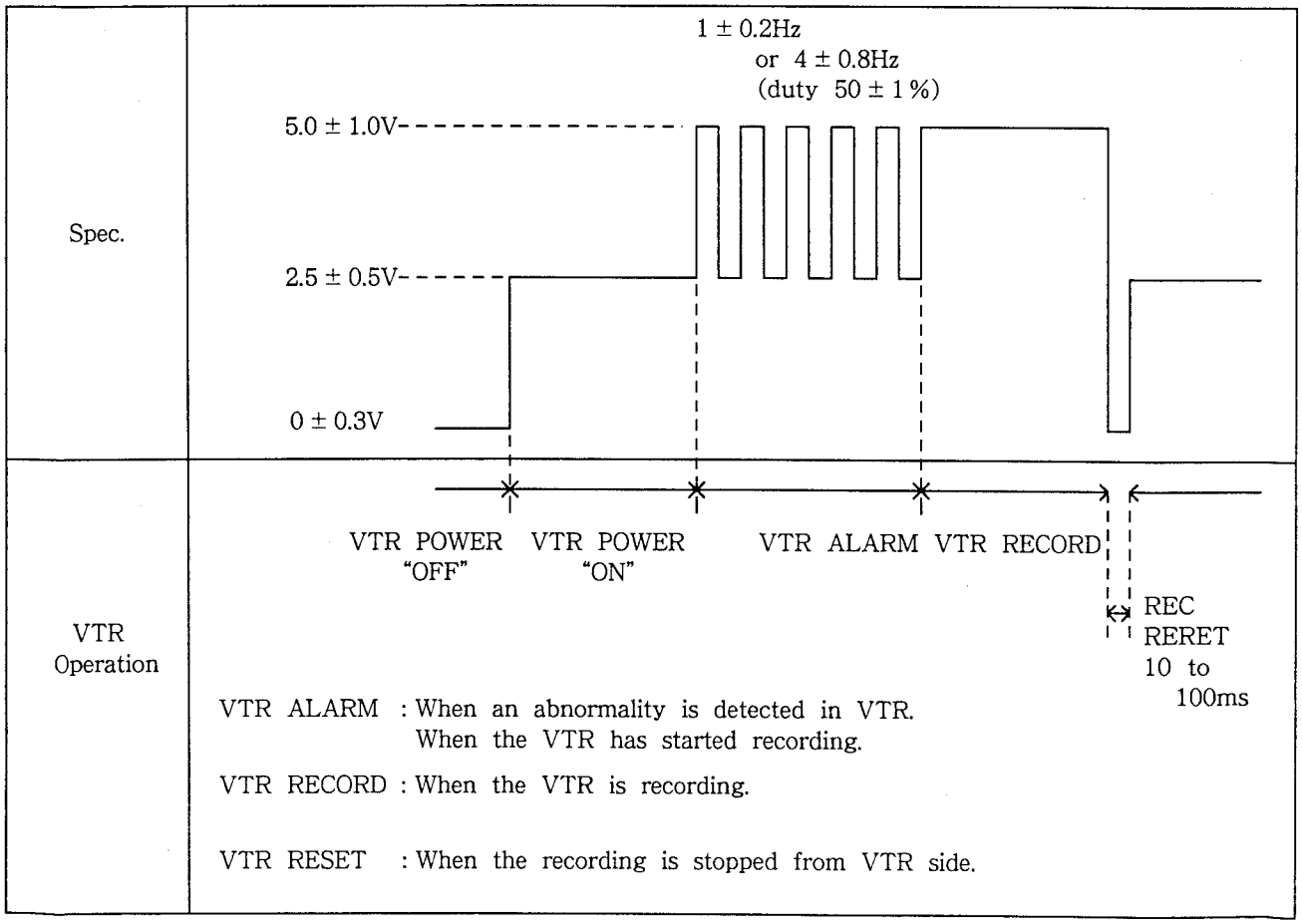
Note 1 : (BATT IND)

The VTR has a battery voltage detection circuit and warning signal output circuit. The circuit informs the camera of the battery voltage drop by sending the following signal to pin 13. The camera uses the LED on the viewfinder to warn the user of the condition.

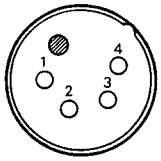
VTR Battery voltage	more than 11.1Vdc	10.8 to 11.1Vdc	less than 10.8Vdc
Spec.	2.5 ± 0.5V 0 ± 0.5V	1 ± 0.2Hz or 4 ± 0.8H (duty 50 ± 1 %)	
LED in Viewfinder	Goes out	Blinks	Lights

Note 2 : Pin 15 (REC/TALLY)

This signal indicates the operating status of VTR. The specifications of the signal is shown below.


Spec.
1 ± 0.2Hz
or 4 ± 0.8Hz
(duty 50 ± 1 %)
5.0 ± 1.0V
2.5 ± 0.5V
0 ± 0.3V
VTR Operation
VTR POWER "OFF"
VTR POWER "ON"
VTR ALARM
VTR RECORD
REC RERET 10 to 100ms
VTR ALARM : When an abnormality is detected in VTR. When the VTR has started recording.
VTR RECORD : When the VTR is recording.
VTR RESET : When the recording is stopped from VTR side.

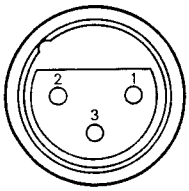
DC (4P, MALE)



(EXT VIEW)

No.	Signal	Specification
1	EXT DC IN (G)	GND
2		
3		
4	EXT DC IN (X)	10.5 to 17.0 Vdc

MIC (3P, FEMALE)



(EXT VIEW)

No.	Signal	Specification
1	MIC IN (G)	GND for MIC
2	MIC IN (X)	− 60 dBm Zi ≦ 600 Ω BALANCED (Phantom : 48V ± 4V)
3	MIC IN (Y)	

2-3-2. Connections

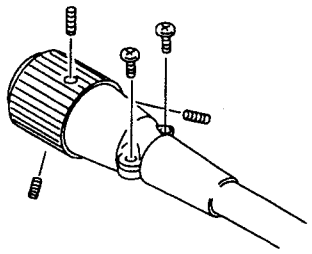
Connections made with the connector panels during installation or service, should be made with the connectors or complete cable assembries specified in the following list, or equivalent parts.

Connector function	Parts No. and name of connector with cable
VTR/CCU/CMA (26P, MALE)	1-564-184-00 CONNECTOR, 26P, FEMALE • For 10P-VTR use CCZJ-2 (2m) CCZJ-5 (5m) • For 14P-VTR use CCZQ-A2 (2m) CCZQ-A5 (5m) CCZQ-A10 (10m) • For 26P-VTR CCZ-A2 (2m) CCZ-A5 (5m) CCZ-A10 (10m) • For 14P-CCU use CCZQ-A2AM (2m) • For 26P-CCU use CCZ-A25 (25m) CCZ-A50 (50m) CCZ-A100(100m)
DC IN (4P, MALE)	1-506-261-00 XLR-4P, FEMALE 1-551-969-00 CORD, with CONNECTOR
MIC IN (3P, FEMALE)	1-516-125-00 XLR-3P, MALE Canon XLR-3-12C equallity
GENLOCK (BNC)	1-560-069-00 PLUG, BNC

2-3-3. Removal of the CCZ/CCZJ/CCZQ Connectors

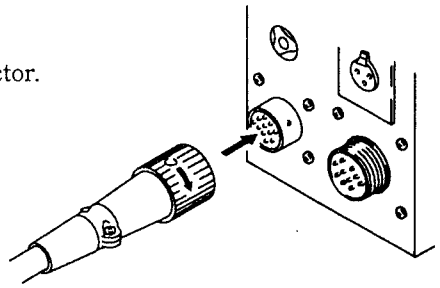
Step 1.

Remove the three hexagonal setscrews and the two setscrews.



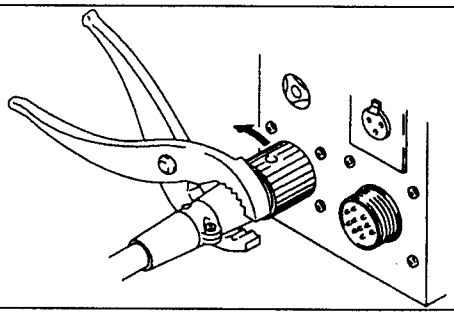
Step 2.

Fix the CCZ/CCZJ/CCZQ connectors at the camera or VTR connector.



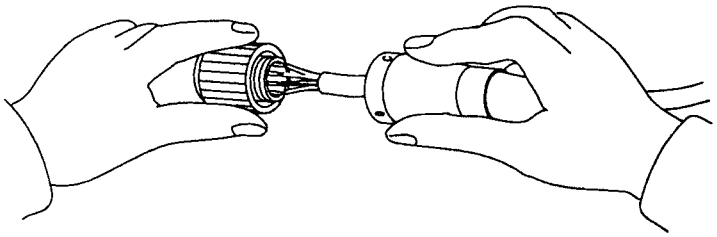
Step 3.

Rotate the CCZ/CCZJ/CCZQ connectors to counterclockwise by the plier and loosen it.



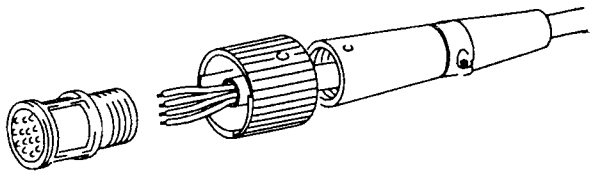
Step 4.

It can be removed by hand and unsolder.



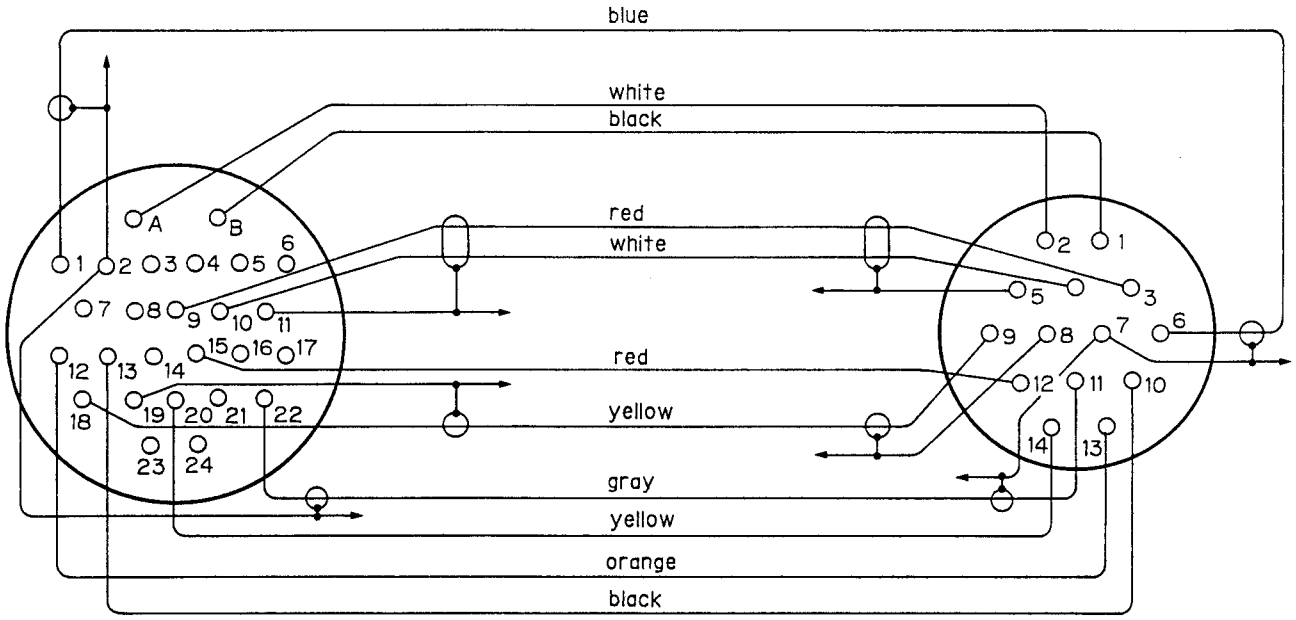
Step 5.

It can be broken up as shown in Figure.



2-3-4. Cable Wiring

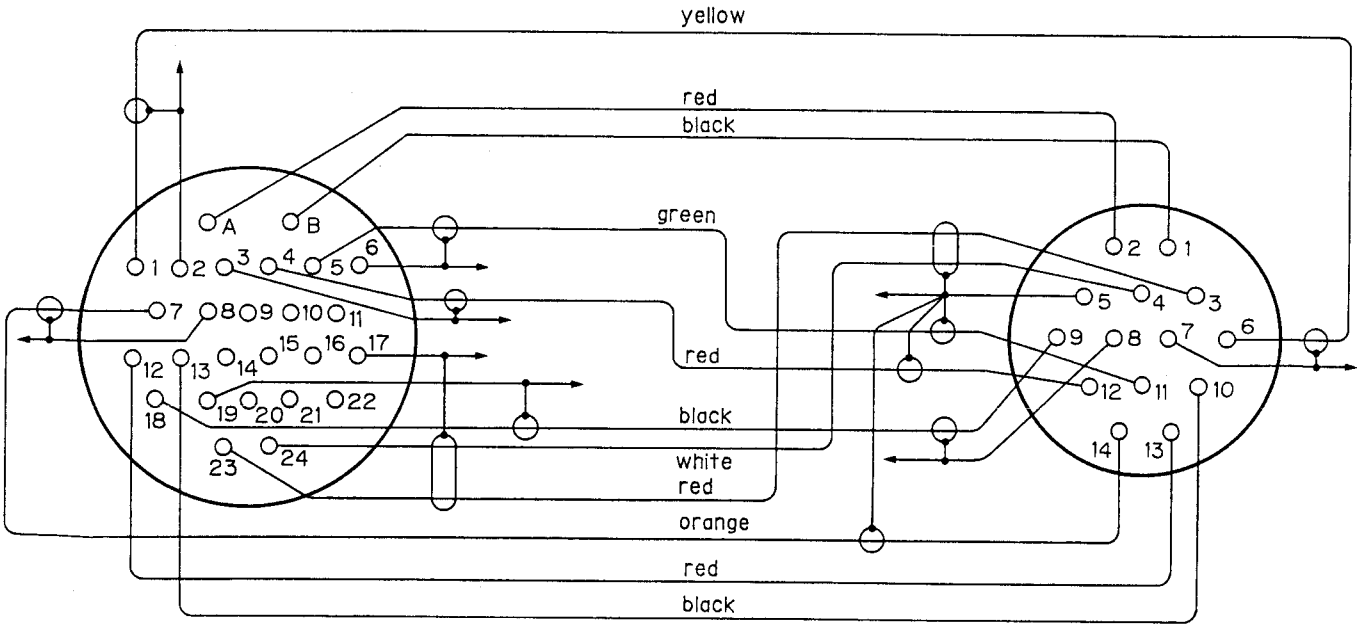
CCZQ-An Cable (Wiring diagram)



26P CONNECTOR (FEMALE)
(WIRING SIDE)

14P CONNECTOR (MALE)
(WIRING SIDE)

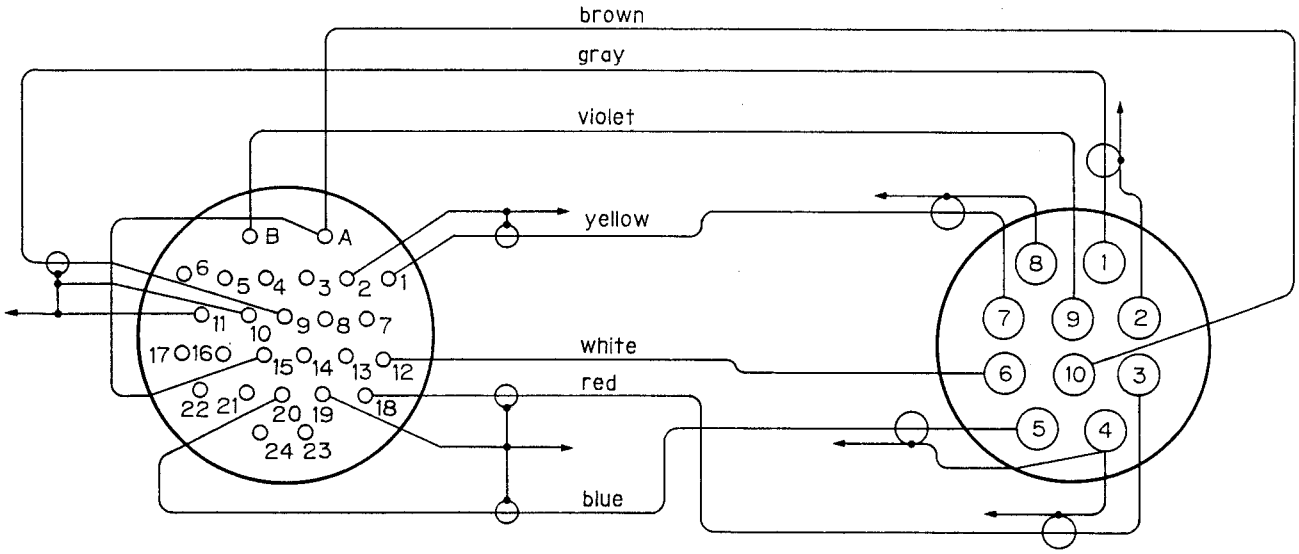
CCZQ - AnAM Cable (Wiring diagram)



26P CONNECTOR (FEMALE)
(WIRING SIDE)

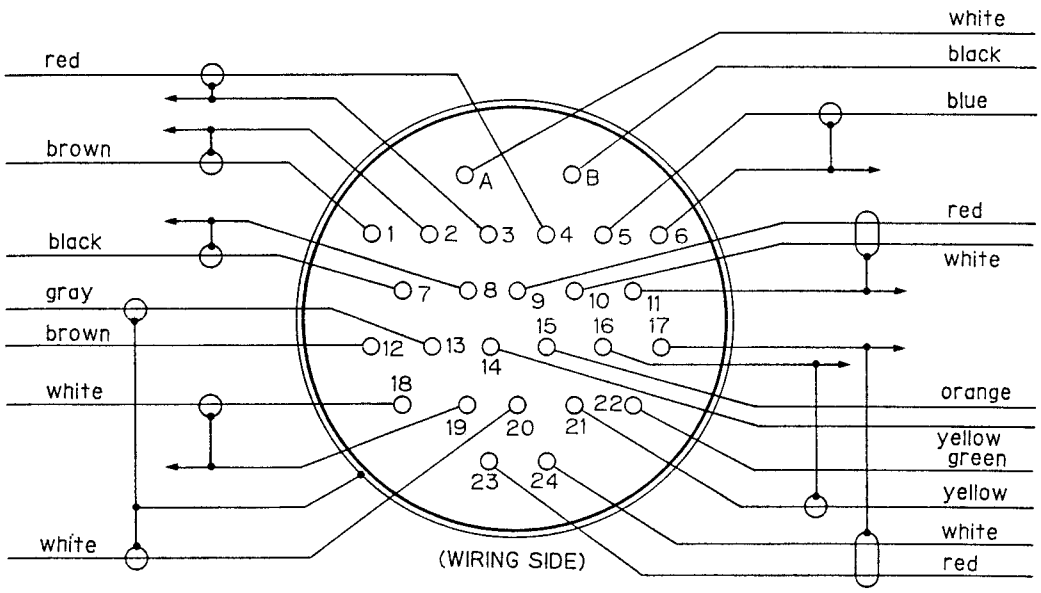
14P CONNECTOR (MALE)
(WIRING SIDE)

CCZJ Cable (Wiring diagram)

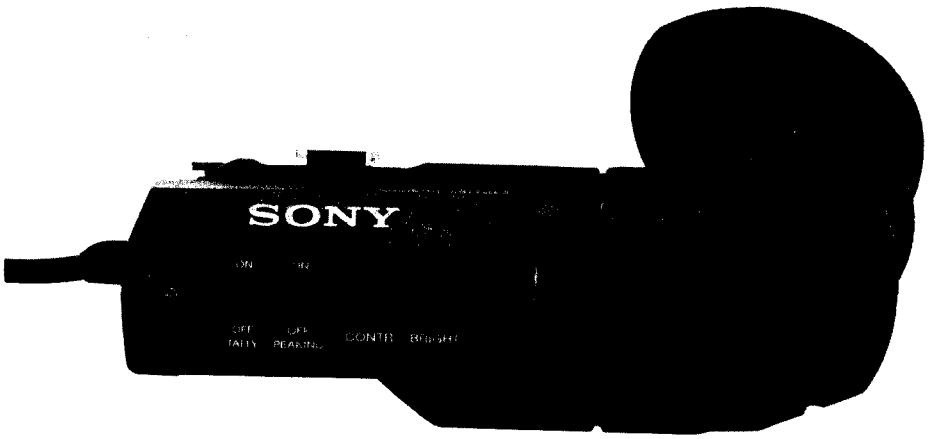


CCZ – An Cable (Wiring diagram)

26p CONNECTOR (FEMALE/MALE)



1.5INCH ELECTRONIC VIEWFINDER



SPECIFICATIONS

Picture tube	1.5-inch monochrome
Indicators	REC/TALLY indicator
	BATT indicator
	SHUTTER indicator
	GAIN UP indicator
Resolution	400 lines
Power requirements	
	12 V DC
Power consumption	
	2.3 W
Weight	Approx. 500 g (1 lb 2 oz)
Dimensions	Approx. 182 × 68 × 205 mm (w/h/d)
Supplied accessory	
	Operating Instructions (1)

Design and specifications are subject to change without notice.

SONY®

SERVICE MANUAL

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SECTION 1
GENERAL DESCRIPTION

The DXF-501/501CE is a 1.5-inch monochrome electronic viewfinder designed to be used with the Sony DXC-327/327P series color video camera. This instruction manual is for both the DXF-501 and the DXF-501CE. The operating instructions for both viewfinders are the same, but their signal systems and their color video cameras to be connected are different.

	Signal system	Color video camera
DXF-501	EIA standards, NTSC color system	DXC-327 and DXC-325 series camera
DXF-501CE	CCIR standards, PAL color system	DXC-327P and DXC-325P series camera

Please refer to the camera's instruction manual for the viewfinder's operation.

1-1. PRECAUTIONS

Operation

- Do not use the unit in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not point the viewfinder directly at the sun, or the plastics inside the viewfinder may be damaged.
- Do not use the viewfinder except within −10°C to +45°C (14°F to 113°F).
- Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Allow adequate air circulation to prevent internal heat build-up.
- Do not expose the unit to the extremely high temperature and humidity.

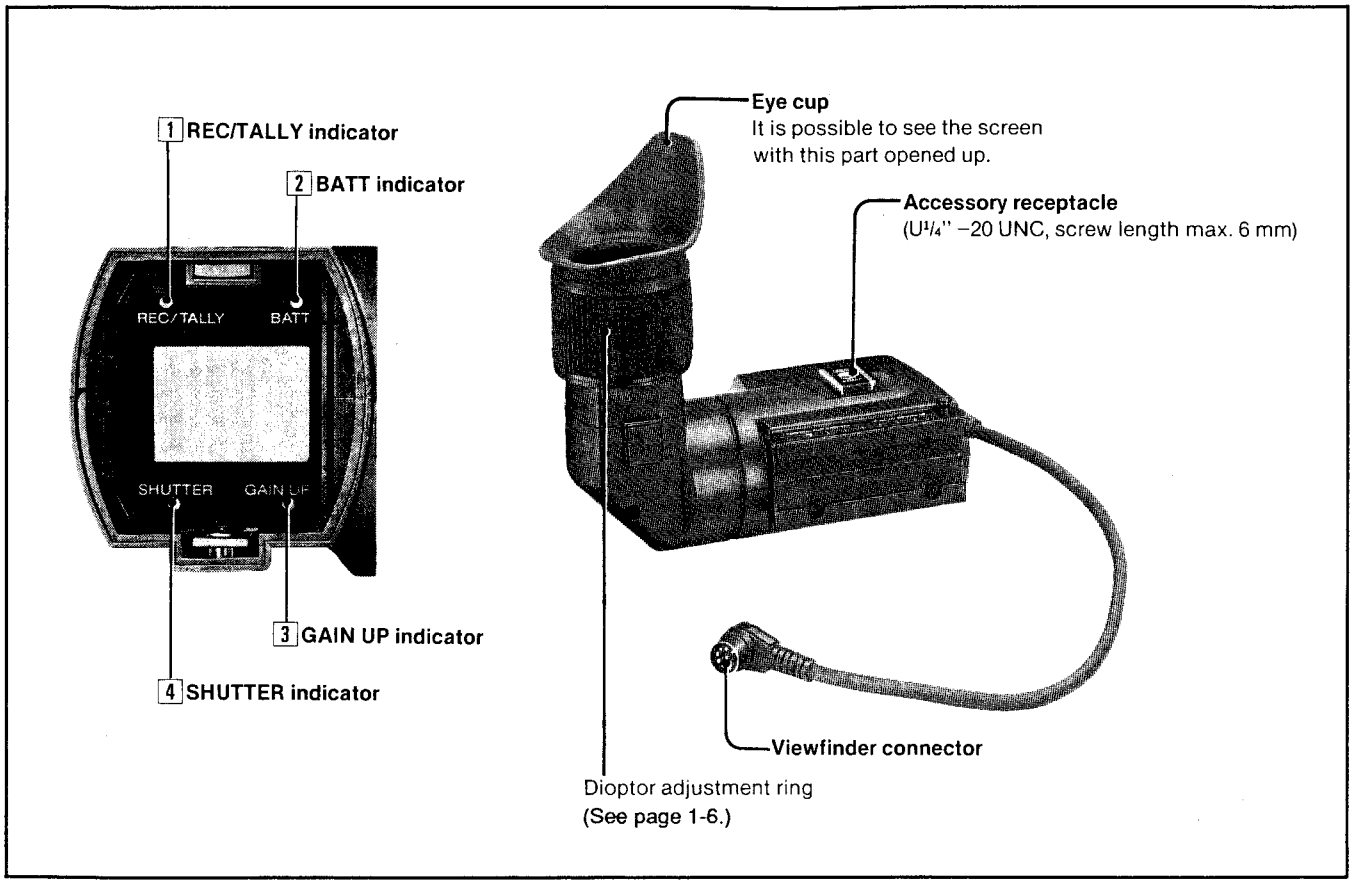
Cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which might damage the finish.

Repacking

Do not discard the carton. It affords maximum protection whenever the unit is transported.

1-2. LOCATION AND FUNCTION OF PARTS

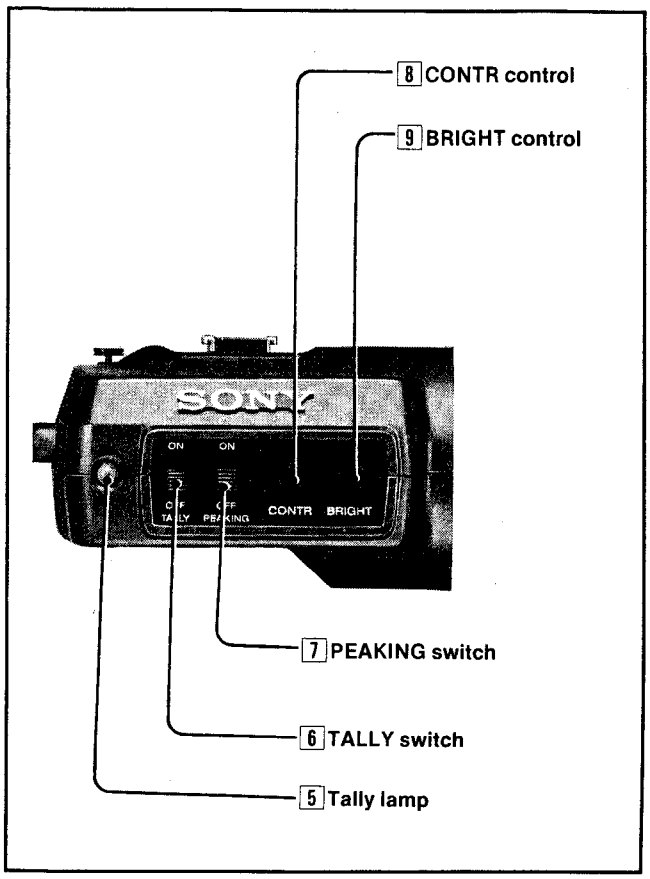


1 REC/TALLY indicator
Lit during recording with one camera, and lit when the camera's picture is selected by a control consoleor, a video switcher, connected to the CCU-M3/M3P camera control unit which is connected to the camera.
The indicator blinks depending on the warning system of the VTR.

2 BATT (battery) indicator
Starts blinking several minutes before the battery of the VTR, the CCU-M3/M3P camera control unit or the camera adaptor is discharged to a level at which it cannot power the VTR or the camera control unit (about 11 V), and illuminates steadily when the battery has discharged to that level. (For details, refer to the camera's operating instructions.)

3 GAIN UP indicator
Lights up when the GAIN selector is set to the 9 dB or 18 dB.

4 SHUTTER indicator
This indicator lights up when the SHUTTER switch on the camera head is set to ON.



5 Tally lamp
When the TALLY switch 6 is set to ON, this lamp operates the same as the REC/TALLY indicator 1.

6 TALLY switch
ON: The tally lamp 5 is activated.
OFF: The tally lamp 5 is deactivated.

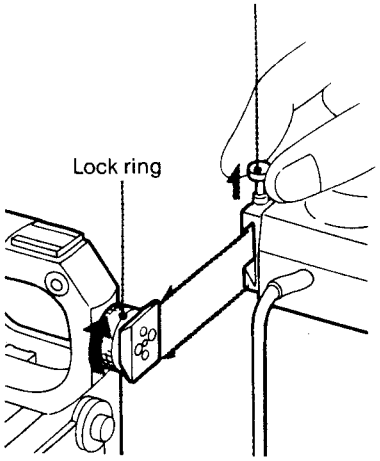
7 PEAKING switch
ON: The picture on the viewfinder screen will be sharpened so that the lens can be focused easily.
OFF: Normal position.

8 CONTR (contrast) control
Used to adjust the contrast of the picture on the viewfinder screen.
This control does not affect the output signal of the camera.

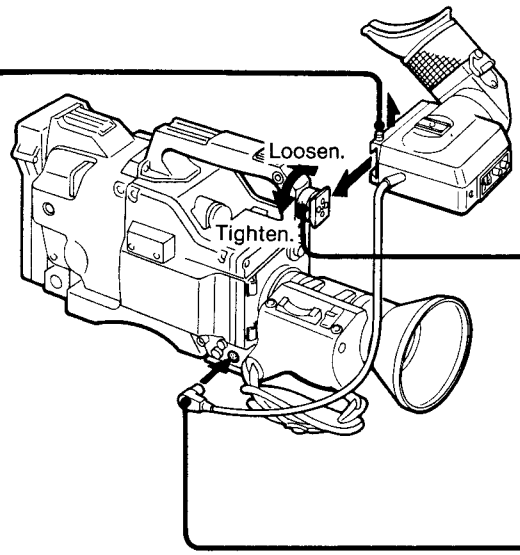
9 BRIGHT (brightness) control
Used to adjust the brightness of the picture on the viewfinder screen.
This control does not affect the output signal of the camera.

1-3. ATTACHING THE ELECTRONIC VIEWFINDER TO THE CAMERA

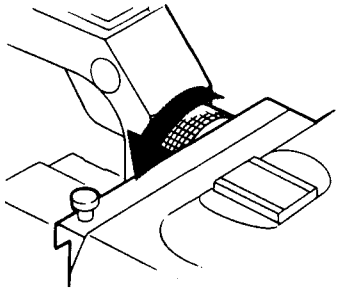
1 Loosen the lock ring, and align and slide the viewfinder into the mount, while pulling the pin up.



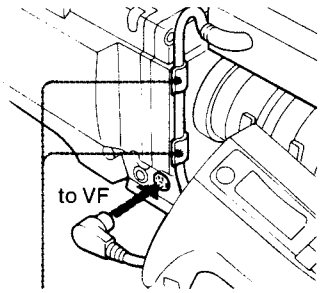
To detach the viewfinder, loosen the lock ring, and slide the viewfinder while pulling the pin up.



2 Tighten the lock ring.



3 Connect the viewfinder connector.



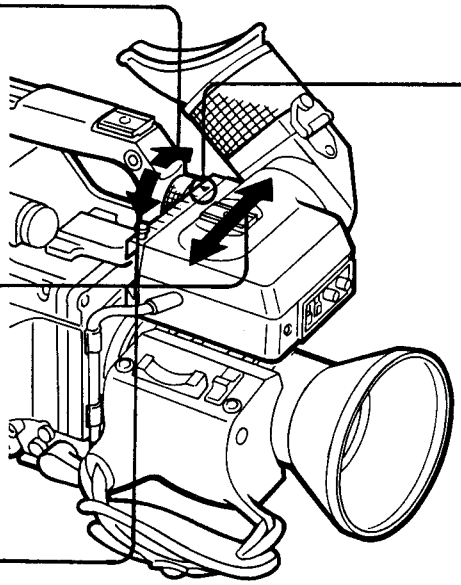
1-4. FOR EASY OPERATION OF THE VIEWFINDER

Adjustment of the horizontal position

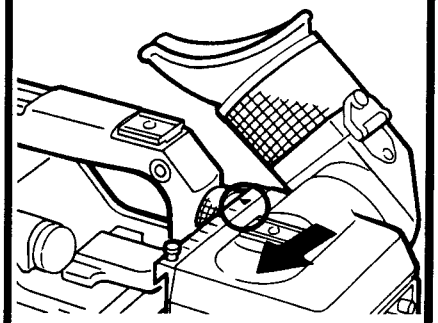
1 Loosen the lock ring.

2 Slide the viewfinder to the desired position.

3 Tighten the ring.

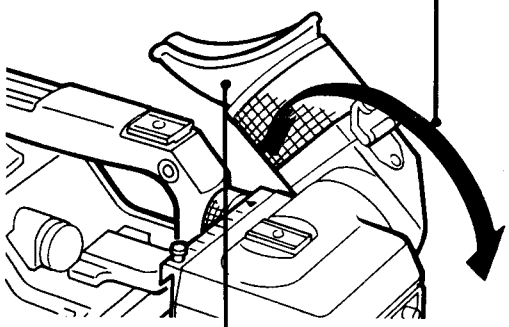


To insert the camera into the carrying case with the viewfinder attached to it, slide the viewfinder to the left side and tighten the lock ring.



Adjustment of the eye cup position

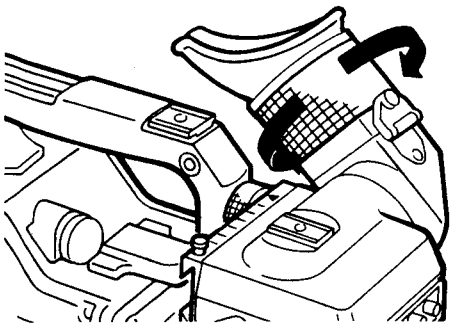
1 Tilt the eye cup up and down for comfortable use.



2 Rotate the eye cup to fit your left or right the eye.

1-5. DIOPTER ADJUSTMENT

Each operator's eyesight is different, so it may be necessary to adjust the diopter when a new operator uses the viewfinder.
Turn the diopter ring after focusing. The adjustable range is from −1D to −3D.



1-6. OPERATION

1 Turn on the power to the camera. The power is supplied to the viewfinder automatically.

2 Adjust the position and angle of the viewfinder screen for easy viewing as shown in "For Easy Operation of the Viewfinder" on page 1-5.
If necessary, adjust the diopter as shown in "Diopter Adjustment" on page 1-6.

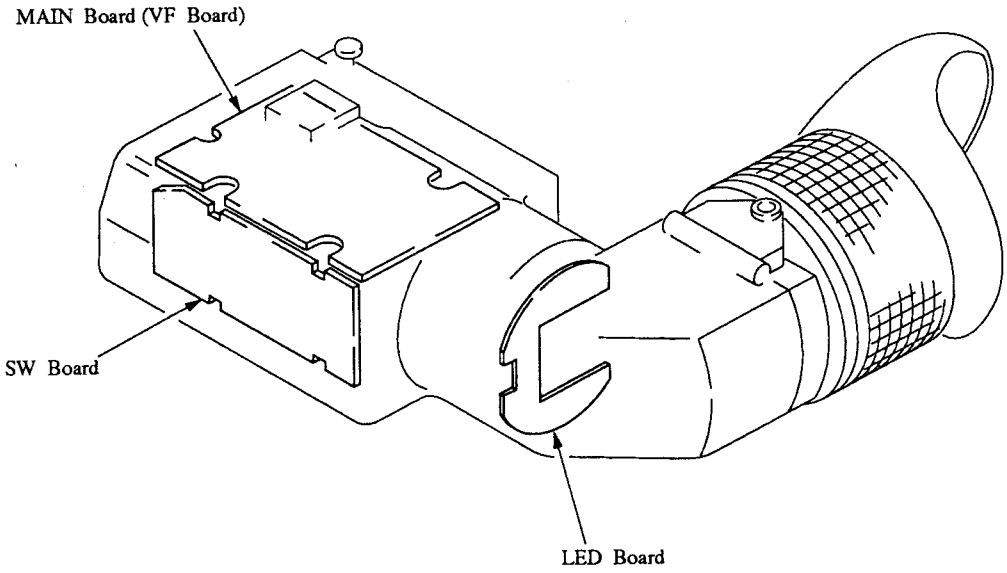
3 Adjust the CONTR and BRIGHT controls for the best picture.

4 While recording, the picture shot by the camera appears on the screen, and the REC/TALLY indicator lights. Focus on the object while viewing the picture on the viewfinder screen.
If necessary, use the VF MARKER selector on the camera to display the safety zone and/or center marker on the viewfinder screen.

- When the VTR is in the playback mode, the playback picture appears on the screen.
- The settings of the PEAKING switch, and the CONTR and BRIGHT controls do not affect the video output signal of the camera.
- When the BRIGHT control is turned fully counterclockwise, the picture does not appear on the screen.

SECTION 2
SERVICE INFORMATION

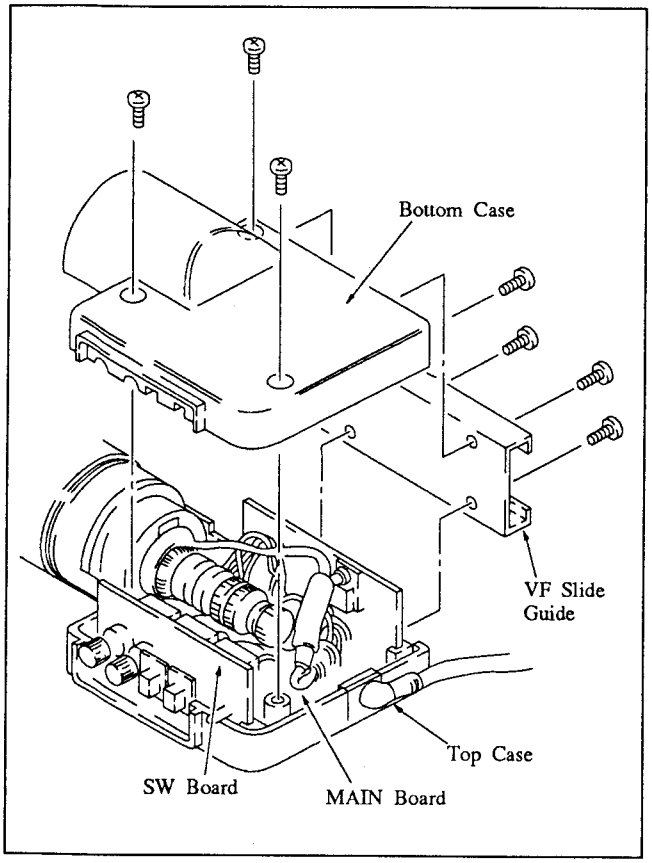
2-1. BOARD LAYOUT



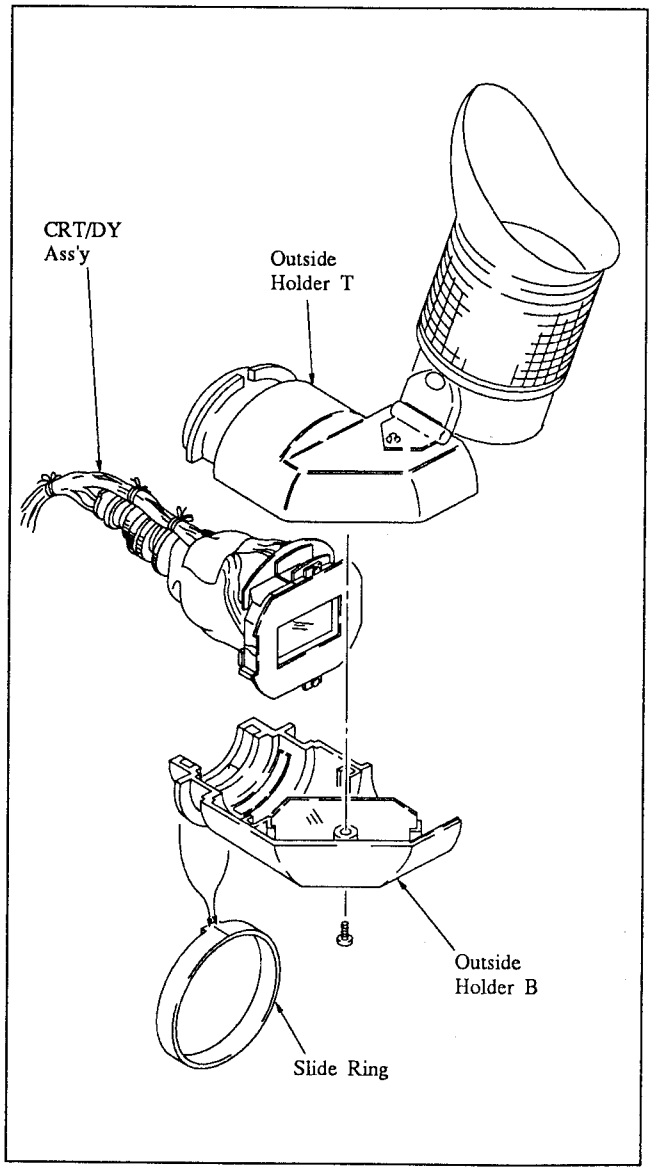
2-2. REPLACEMENT OF CRT/DY ASSY

Note: If a deflection yoke is replaced, you should replace assembly of CRT and deflection yoke (CRT/DY ASSY).

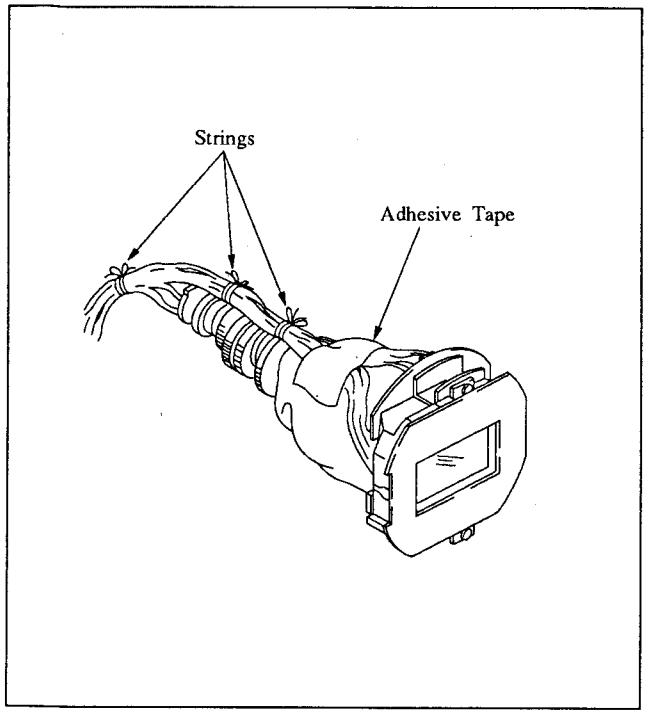
1. Remove seven screws shown in Figure.
   Remove the bottom case and VF slide guide.
   Extract the SW board and MAIN board from a top case.



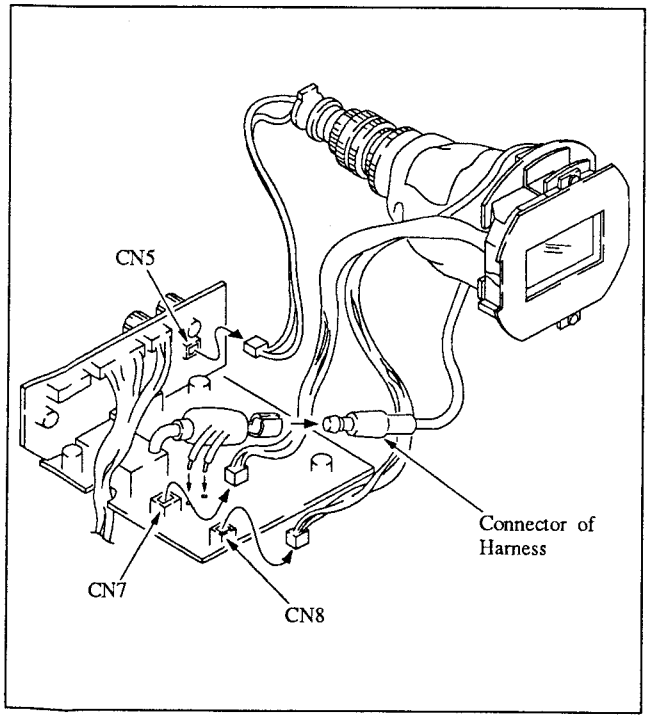
2. Remove the slide ring shown in Figure.
   Remove a screw and remove the CRT/DY ASSY from outside holders B and T.



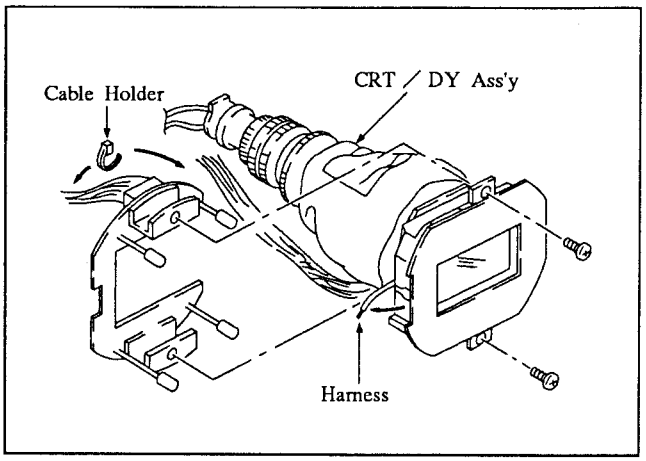
3. Untie three strings and remove an adhesive tape.



4. Disconnect a connector CN5 on the SW board and disconnect two connectors CN7 and CN8 on the MAIN board. Unsolder two wires and disconnect the connector of harness as illustrated.



5. Unsolder the harness shown in Figure.
   Remove two screws and remove the LED board from the CRT/DY ASSY.
   Note: When removing the LED board, be careful not to damage four LEDs (light-emitting diodes) on the LED board.



6. When installing a new CRT/DY ASSY, reverse the procedures above.

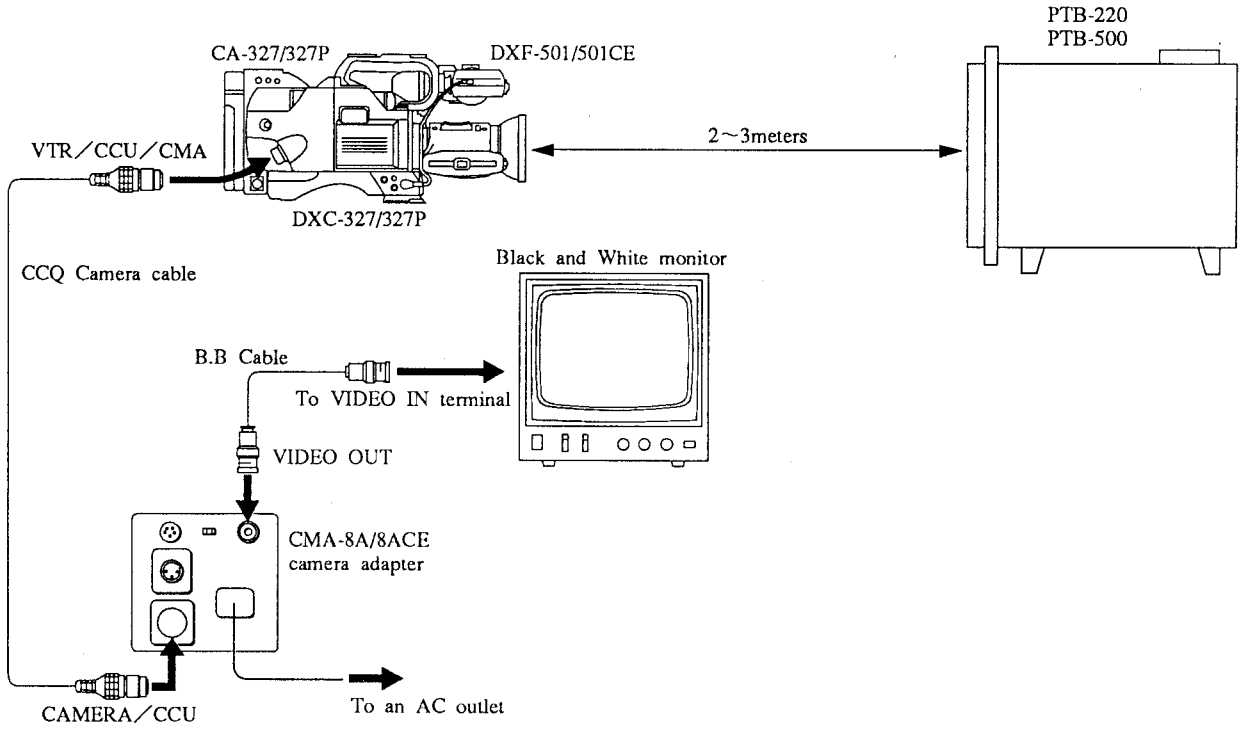
SECTION 3
ALIGNMENT

3-1. PREPARATION

3-1-1. Equipment Required

1. Pattern Box PTB-220/500
   Sony Part number J-6020-680-A or Pattern Box PTB-500
   Sony Part number J-6029-140-A
2. Resolution chart: Sony Part number J-6021-870-A
3. Video Camera DXC-327/327P
4. Camera Adapter CA-327/327P
5. AC Adapter CMA-8A/8ACE
6. Camera Cable CCQ-2BRS
7. Black and White monitor PVM-91 or equivalent
8. Oscilloscope
9. Waveform Monitor

3-2. CONNECTION AND INITIAL SETTING



3-2-1. Initial Setting

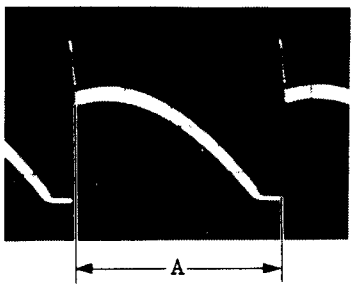
1. Set the camera switches and controls as follows.
   DXC-327 Video Camera
   BARS switch: ON
   GAIN selector: 0 dB
   DXF-501 Viewfinder
   CONTR control: Fully clockwise
   BRIGHT control: Center
   Lens
   Iris selector: AUTO
2. Preparation for picture
   (1) Adjust the zoom control so that the resolution chart frame touches the underscanned picture frame on the monitor.
   (2) Adjust the iris control for the best resolution of the monitor.

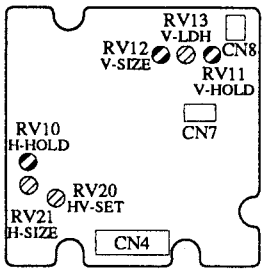
3-3. VF SYSTEM ADJUSTMENT

3-3-1. Vertical Hold Adjustment

Equipment: Oscilloscope
Preparation: 1. Pull the ES-2 board out of the camera.
2. Set ◐RV12 (V SIZE)/MAIN board to the mechanical center unless it is marked.
Test point: CN8–1pin/MAIN board
Adj. point: ◐RV11 (V HOLD)/MAIN board
Specification: A=25.6±0.3 mS

Note: After this adjustment is completed, insert the ES-2 board into the camera.



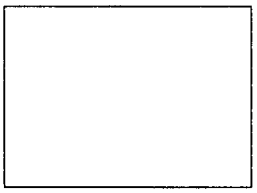


MAIN BOARD
(COMMPONENT SIDE)

3-3-2. Horizontal Hold Adjustment

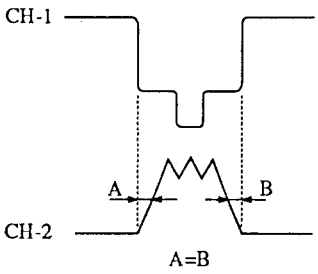
Object: White window chart
Equipment: Oscilloscope, Waveform monitor
Trigger: CH2/Oscilloscope
Preparation:
1. Adjust the zoom control so that the white window frame touches the underscanned picture frame on the monitor screen.

Monitor Screen



2. Adjust the iris control so that the white level at VBS OUT terminal is as follows.
NTSC : 100±2 IRE
PAL : 700±14 mV

Test point: CH1 CN5–1pin
CH2 CN4–3pin
Adj. point: ◐RV10 (H HOLD)/MAIN board
Adjustment:

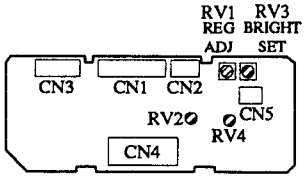


3-3-3. Bright Calibration Adjustment

Object: Resolution chart

Preparation: Turn ⊘RV4 (BRIGHTNESS)/SW board → fully counterclockwise.
Turn ⊘RV2 (CONTRAST)/SW board → fully clockwise.

Adjustment: Adjust the picture by turning ⊘RV3/SW board counterclockwise from the rightmost position so that the black and white gradation scale is black up to the third step and the fourth step is recognizable.



SW BOARD
(COMPONENT SIDE)

3-3-4. Focus Adjustment

Note: Step 3-3-5. Picture Frame Adjustment and this adjustment affect each other.
Repeat these adjustments until both specifications are met.

Object: Resolution chart

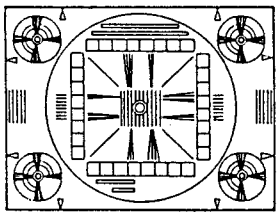
Equipment: Waveform monitor

Preparation:
1. Iris selector (Lens) → "MANU"
2. BRIGHT control (Viewfinder) → mechanical center
3. CONTRAST control (Viewfinder) → fully clockwise ↻
4. PEAKING switch (Viewfinder) → "OFF"

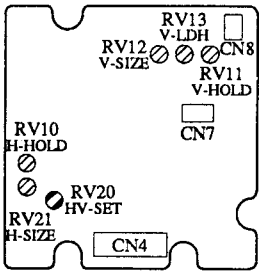
Adjustment:

1. Adjust the zoom control so that the resolution chart touches the underscanned picture frame on the monitor.

Monitor Screen



2. Adjust iris control so that the peak level at TEST OUT terminal is as follows.
   NTSC : 100±2 IRE
   PAL : 700±14 mV
3. Adjust ⊘RV20 (FOCUS)/MAIN board so that the picture on the viewfinder is best focused.



MAIN BOARD
(COMMPONENT SIDE)

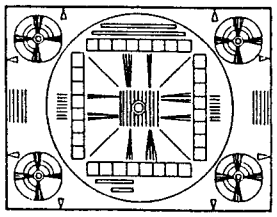
3-3-5. Picture Frame Adjustment

Note: Step 3-3-4. Focus Adjustment and this adjustment affect each other. Repeat these adjustments until both specifications are met.
Object: Resolution chart
Equipment: Waveform monitor
Preparation: 1. BRIGHT control (Viewfinder)
→ mechanical center
2. CONTRAST control (Viewfinder)
→ mechanical center
3. PEAKING switch (Viewfinder)
→ "OFF"
4. Remove the eye cap from the viewfinder.

Adjustment:

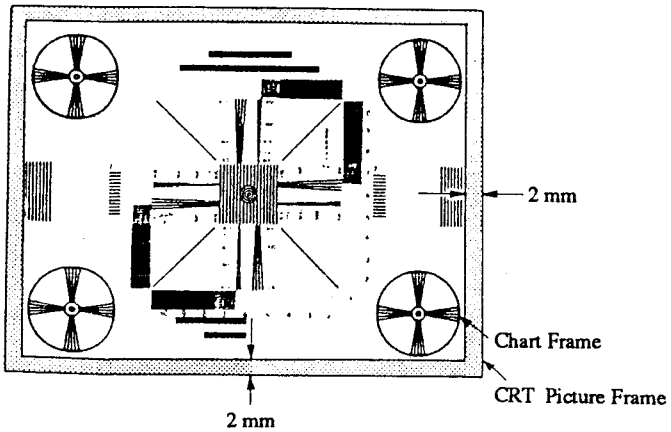
1. Adjust the zoom control so that the resolution chart frame touches the underscanned picture frame on the monitor screen. Adjust the iris control so that the white level at TEST OUT terminal is 100±2 IRE.

Monitor Screen

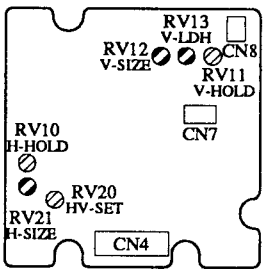


2. Adjust ⊘RV21 (H SIZE)/MAIN board so that the H size of resolution chart is underscanned by approx. 2 mm from the CRT picture frame.
3. Adjust ⊘RV12 (V SIZE)/MAIN board so that the V size of resolution chart is underscanned by approx. 2 mm from the CRT picture frame.

Viewfinder Screen



4. Adjust ⊘RV13 (V LIN)/MAIN board so that the distortion of each circle at the four corners of resolution chart is minimized.
5. Repeat item 2 to item 4 until the specifications are met.



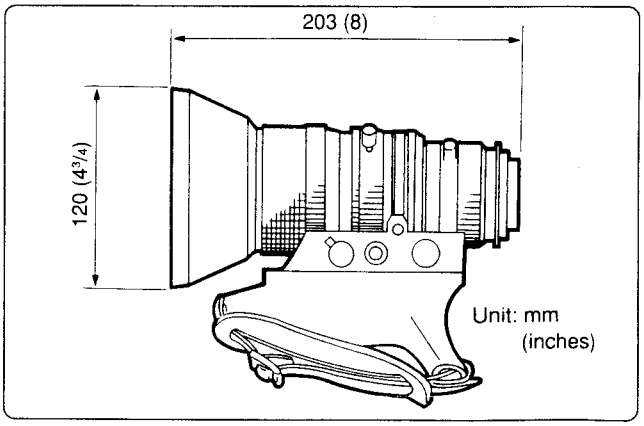
MAIN BOARD
(COMMPONENT SIDE)

ZOOM LENS

SPECIFICATIONS

Focal length	9.5 to 152 mm
Zoom	Manual and motorized, selectable
	Zooming ratio: 16×
Maximum aperture ratio	
	1:1.8
Iris control	Manual and auto, selectable
	1.8 to 16 and C (closed)
Range of object field (at the distance of 0.95 m)	
	W (wide angle): 823 × 617 mm
	(32 1/2 × 24 3/8 inches)
	T (telephoto): 51 × 38 mm
	(2 1/8 × 1 1/2 inches)
Minimum object distance	
	0.95 m
Filter thread	77 mm dia., 0.75 pitch
Mount	Bayonet mount, 2/3 inch
Weight	About 1.4 kg (3 lb 1 oz) without lens hood
Supplied accesory	
	Operating instructions (1)

Dimensions



Design and specifications are subject to change without notice.

SONY®

SERVICE MANUAL

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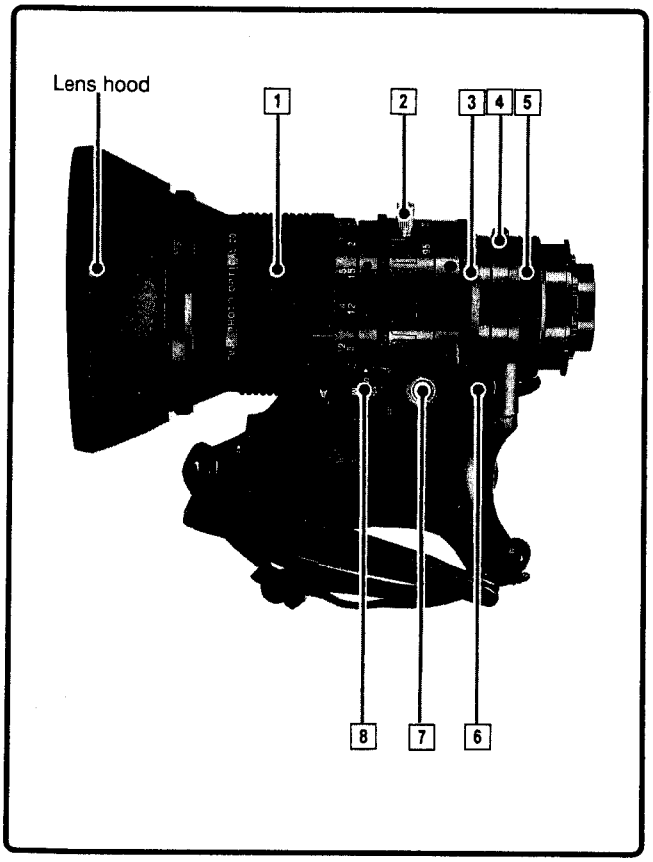
SECTION 1
GENERAL DESCRIPTION

1-1. LOCATION AND FUNCTION OF PARTS AND CONTROLS



1 **Focus ring**
Turn this ring for focusing.

2 **Manual zoom lever**
For manual zooming, turn this lever with the ZOOM selector 8 set to the M position.

3 **Iris ring**
For manual iris adjustment, turn this ring with the IRIS selector 10 set to the M position.

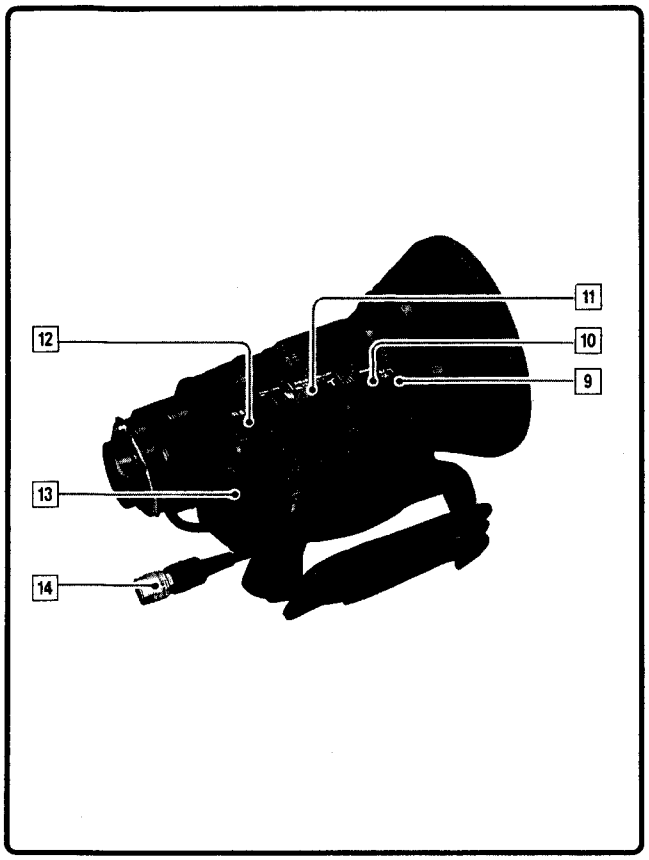
4 **Ff (flange focal length) adjustment ring**
For Ff adjustment, release the screw and turn the ring.

5 **MACRO ring**
Used for close-ups.

6 **Zoom remote control connector (8-pin)**
Connect an LO-23 lens remote control unit (optional) for remote control of zooming.

7 **Focus remote control connector (3-pin)**
Not used.

8 **ZOOM selector**
S: For motorized zooming.
M: For manual zooming.



9 Instant automatic iris adjustment button
The iris is automatically adjusted while this button is kept depressed when the IRIS adjustment selector 10 is set to M. When the button is released, the iris will be fixed at the value that has just been obtained by the automatic adjustment until the iris is adjusted again manually.

10 IRIS selector
A (automatic): For automatic iris adjustment.
M (manual): For manual iris adjustment.

11 Motorized zoom switch
Press either end of this switch for motorized zooming with the ZOOM selector set to S:W for a wide-angle picture and T for a telephoto picture. Zooming is fast when the switch is pressed down all the way and becomes slower when the switch is pressed down slightly.

12 RET (return video) button
Press to view the return video or the playback picture from the VTR on the viewfinder screen. (For details, refer to the instruction manual supplied with the camera.)

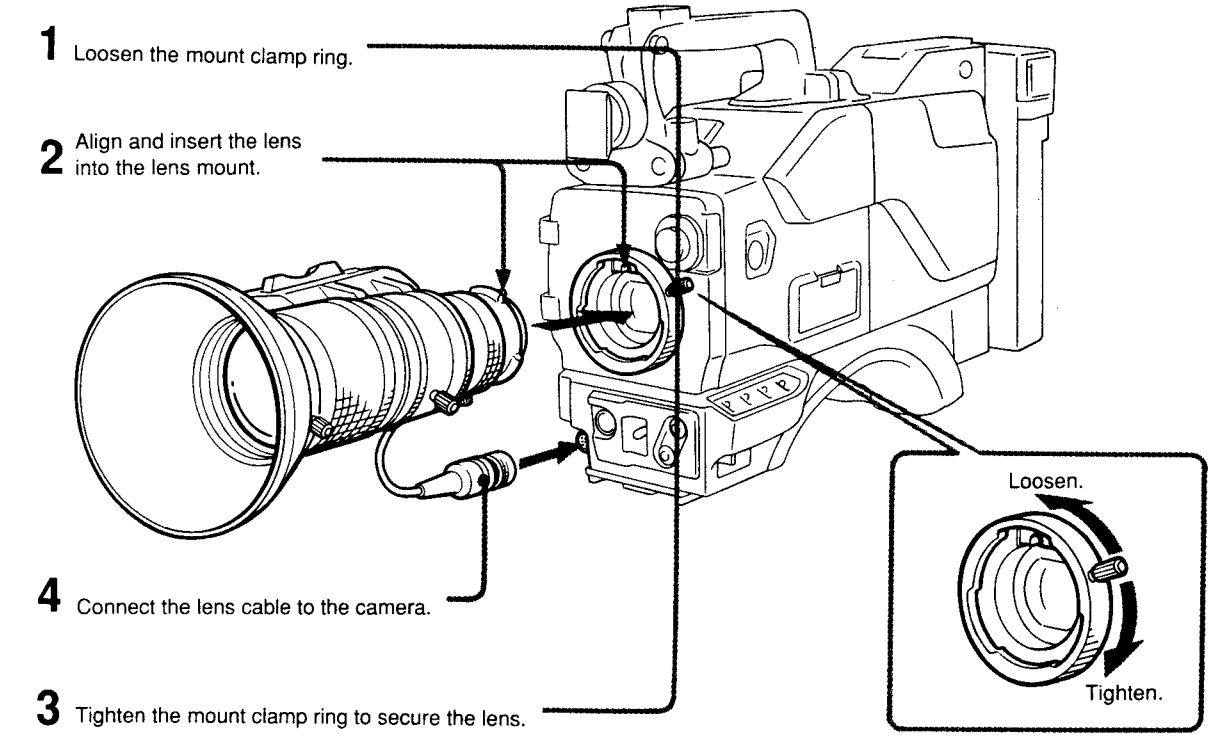
13 VTR button
When a portable VTR is connected to the camera, press this button to start and stop recording.
When a CCU-M7/M7P/M3/M3P camera control unit is connected to the camera, press this button to view the return video on the viewfinder screen.

14 Lens cable (12-pin)

1-2. HOW TO ATTACH THE LENS TO THE CAMERA

Note

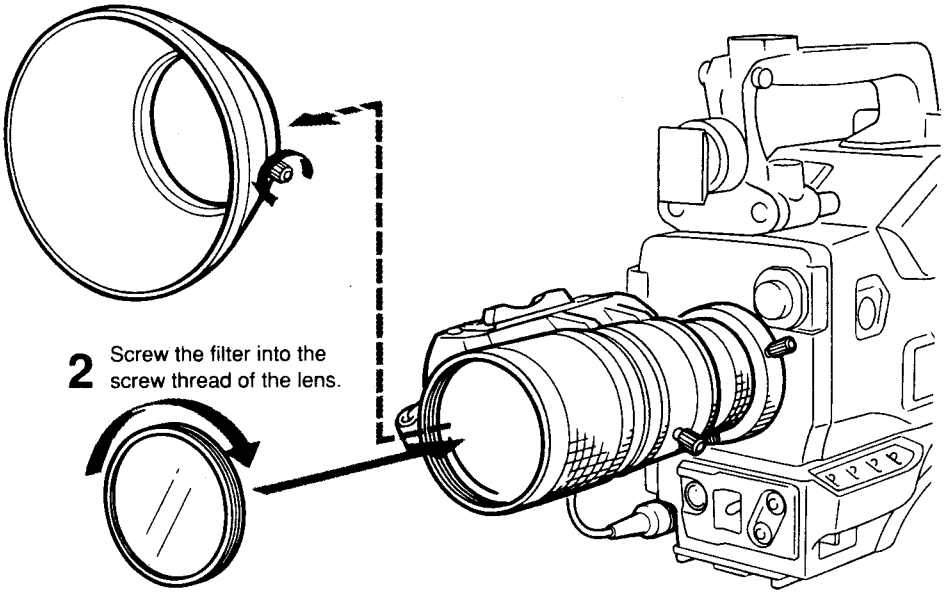
If the protective cap is placed over the mount of the lens, remove it before attaching the lens.


1 Loosen the mount clamp ring.
2 Align and insert the lens into the lens mount.
4 Connect the lens cable to the camera.
3 Tighten the mount clamp ring to secure the lens.
Loosen.
Tighten.

How to attach a filter to the lens

Detach the lens hood, then screw the filter on clockwise to attach.

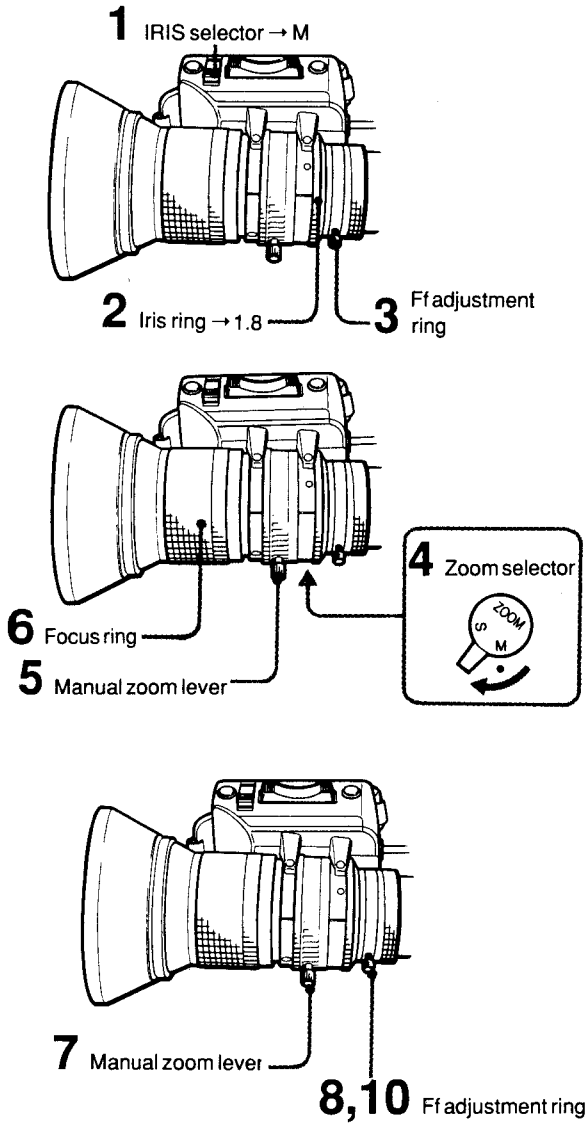
1 Detach the hood.



2 Screw the filter into the screw thread of the lens.

1-3. FLANGE FOCAL LENGTH ADJUSTMENT

The proper flange focal length adjustment insures that the object is in focus both at the wide-angle position and at the telephoto position when zooming.



1 Set the IRIS selector to M.

2 Set the iris ring to "1.8".
Position an appropriate object and illuminate it so that the proper video level is obtained when the iris ring is set to "1.8".

3 Loosen the screw on the Ff adjustment ring.

4 Set the ZOOM selector to M.

5 Turn the manual zoom lever to the "152" telephoto position.

6 Turn the focus ring until the chart at about three meters (10 feet) from the lens is in focus.

7 Turn the manual zoom lever to the "9.5" wide-angle position.

8 Turn the Ff adjustment ring and focus on the chart used in step 6.

9 Repeat steps 5 through 8 until the object is in focus both at the telephoto position and at the wide-angle position.

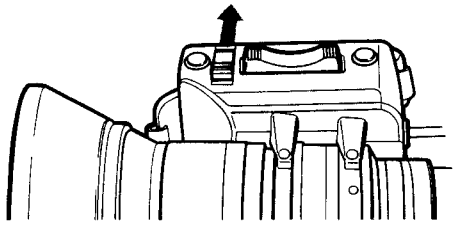
10 Tighten the screw on the Ff adjustment ring firmly.

Once the flange focal length adjustment has been made, readjustment is not necessary as long as the lens stays mounted on the same camera.

1-4. IRIS ADJUSTMENT

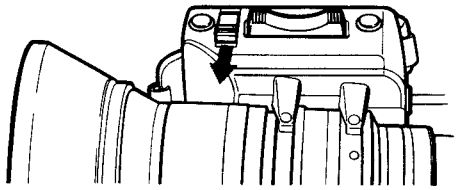
Automatic adjustment

Set the IRIS selector to A, and the iris will be automatically adjusted to the brightness of the object. Normally use the A position.



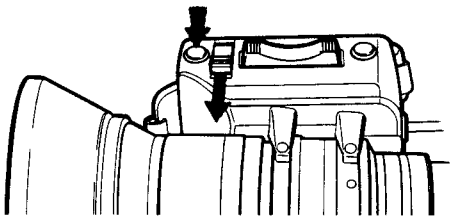
Manual adjustment

Set the IRIS selector to M, and turn the iris ring. Manual adjustment may be effective when recording an object against a bright sky or a scene with high contrast.



Temporary automatic adjustment

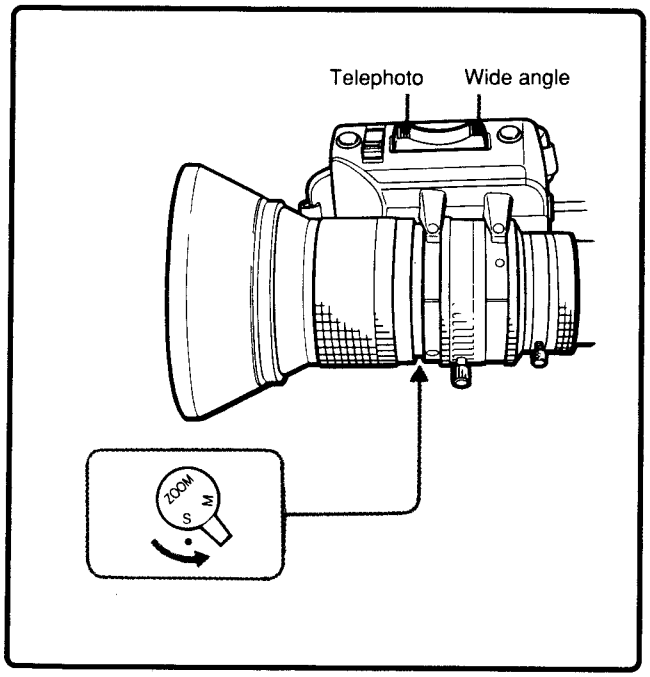
While the instant automatic iris adjustment button is kept depressed during manual iris adjustment, the iris is automatically adjusted. When the button is released, the iris will be fixed at the value that has just been obtained by the automatic adjustment until the iris is adjusted again manually with the iris ring.



1-5. ZOOMING

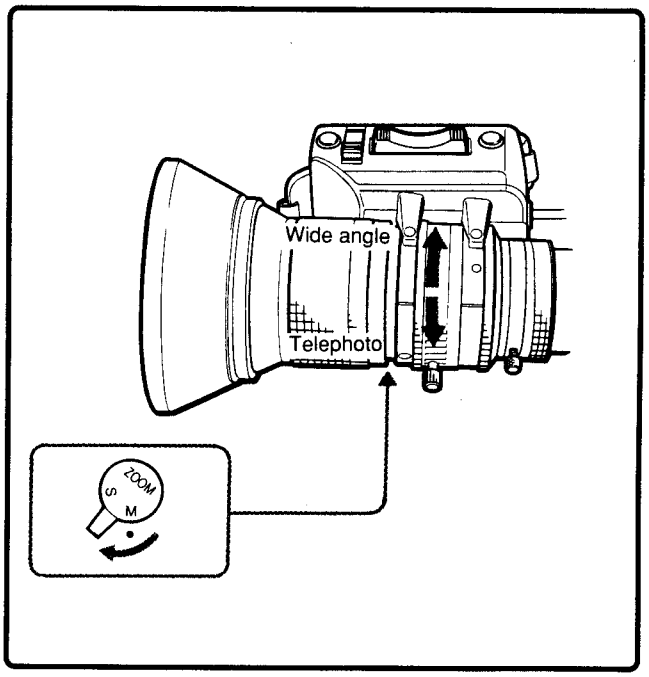
Motorized Zooming

You can zoom smoothly by pressing either end of the motorized zoom switch when the ZOOM selector is set to S. Zooming is fast when the motorized zoom switch is pressed down all the way and becomes slower when the switch is pressed slightly.



Manual Zooming

Manual zooming allows more precise control of the zooming speed. You can zoom manually by manipulating the manual zoom lever with the ZOOM selector set to M.



Tips on Zooming

Zoom in

From wide angle to telephoto. Used to bring a distant object up close.

Correct focusing

If the subject is in focus in the telephone position, it will remain in focus when you zoom back to wide angle.

Zoom out

From telephoto to wide angle. Used to move back from an object and gradually reveal the object's surroundings.

For a more stable picture

We recommend placing the camera on a tripod when zooming. If you zoom with the camera on your shoulder, stand as steady as possible.

Following

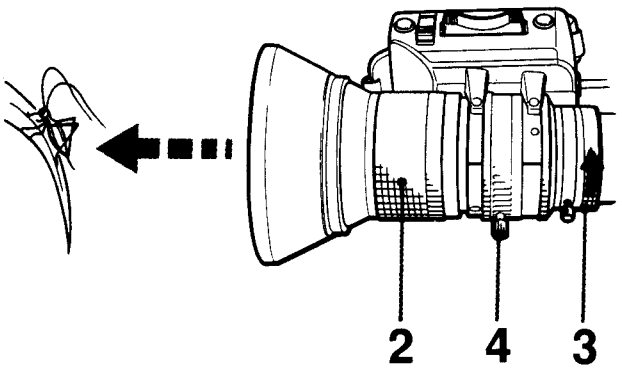
Zoom up on the subject and follow its movement with the camera. This zoom effect is used, for example, to emphasize the speed of the subject by making the background rush past in a blur.

Positioning the object at the center of the screen

For zoom in operacion, adjust the focus in the telephoto position, and set to the wide angle position. Then start zoom in operation. Otherwise the subject may be out of the screen during zooming in.

1-6. CLOSE-UPS—SHOOTING SMALL OR NEARBY OBJECTS

The close-up or macro function lets you zoom in flowers, insects and even photographs. The minimum distance from the lens to the object is 70 mm in the "9.5" wide-angle zoom position.



1 Adjust the distance between the lens and the object to get the desired image size.

2 Set the focus ring to the "∞" setting.

3 Turn the MACRO ring in the direction of the arrow unit it stops.

4 Focus by turning the manual zoom lever with the ZOOM selector set to "M".

When the close-ups operation is completed, return the MACRO ring to its click position.

Note

- If you wish to reduce the object's size on the screen, first adjust the focus following Steps 1 through 4 on the left page, then turn the MACRO ring slightly toward its original position and adjust the focus with the manual zoom lever again.
- If the focus ring is set to "∞" while the MACRO ring is turned in the direction of the arrow until it stops, the focus can be continually adjusted from the close-ups position to "∞" with the manual zoom lever.